Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

Q(β^-)=−10504 *15*; S(n)=13566.5 *22*; S(p)=6.11×10^3 *3*; Q(α)=−2748 *3* 2012Wa38
S(2n)=23883.1 *17*, S(2p)=9529.0 *25* (2012Wa38).

^{70}Se Levels

Cross Reference (XREF) Flags

A	^{70}Br ε decay (79.1 ms)	E	^{40}Ca(^{36}Ar,α2pγ), ^{58}Ni(^{14}N,pnγ)
B	^{70}Br ε decay (2.2 s)	F	^{58}Ni(^{14}N,pnγ), ^{60}Ni(^{12}C,2nγ)
C	^{9}Be(^{70}Se,^{70}Se$'\gamma$)	G	Coulomb excitation
D	^{40}Ca(^{40}Ca,2α2pγ)		

E(level)[†]	J$^\pi$	T$_{1/2}$[‡]	XREF	Comments
0.0[&]	0$^+$	41.1 min *3*	ABCDEFG	%ε+%β^+=100 T$_{1/2}$: from 1974Te04.
944.52[&] *5*	2$^+$	2.23 ps *14*	BCDEFG	Q=+ (2007Hu03) T$_{1/2}$: from weighted average of 2.27 ps *26* (2014Ni09) and 2.22 ps *14* (2008Lj01) using recoil distance Doppler shift method. Others: 1.0 ps *2* from recoil distance Doppler shift method (1986He17) and 1.1 ps *3* (1975GuYV). J$^\pi$: from 944.51γ E2 to 0$^+$. Q: from nuclear reorientation effect in Coulomb excitation (2007Hu03).
1599.9[a] *3*	2$^+$	3.3[#] ps *9*	BCDEF	T$_{1/2}$: Other: < 5.2 ps effective half-life from recoil distance Doppler shift method (2014Ni09). J$^\pi$: from 1600.1γ E2 to 0$^+$.
2010.3 *3*	(0$^+$)		EF	J$^\pi$: (0$^+$) from 1065.8γ Q to 2$^+$ in 1981Ah03. Authors tentatively assigned (0$^+$) for this level based on isotropic angular distribution. Other: (0$^+$) in 1980Wa19, based on the isotropic angular distribution.
2038.8[&] *5*	4$^+$	0.97 ps *7*	BCDEF	T$_{1/2}$: Others: < 3.3 ps, effective half-life from recoil distance Doppler shift method (2014Ni09) and 1.0 ps (1986He17) using recoil distance Doppler shift method deduced from singles data and 2.3 ps *6* (1975GuYV). J$^\pi$: from 1094.4γ E2 to 2$^+$; assumed E2 cascade member.
2382.5[a] *4*	4$^+$	<12[@] ps	B DEF	J$^\pi$: from 782.6γ E2 to 2$^+$; 1438.1γ E2 to 2$^+$; assumed E2 cascade member.
2518.6 *6*	3$^{(-)}$	<1.7 ps	CDEF	T$_{1/2}$: upper limit from effective half-life of 1.29 ps *40* from recoil distance Doppler shift method (2014Ni09). Other: 4.2 ps *6* using recoil distance Doppler shift method (1986He17) using singles data. J$^\pi$: from 1574.1γ D to 2$^+$; 868.8γ from 5$^-$.
2553.1 *10*			E	J$^\pi$: (4$^+$) proposed in ^{40}Ca(^{36}Ar,α2pγ),^{58}Ni(^{14}N,pnγ).
3003.2[&] *5*	6$^+$	1.32 ps *21*	B DEF	T$_{1/2}$: other: 2.7 ps *6* from recoil distance Doppler shift method, deduced using singles (1986He17). J$^\pi$: from 964.39γ E2 to 4$^+$; assumed E2 cascade member.
3139.6 *3*			F	
3218.4[a] *6*	(6$^+$)		D	J$^\pi$: from 835.9γ to 4$^+$; assumed E2 cascade member.
3356.4 *11*			E	
3387.4 *5*	5$^-$	6.1[#] ps *17*	DEF	J$^\pi$: from 528γ E2 from 7$^-$, 1348.6γ to 4$^+$.
3524.1 *6*	(5$^-$)	<9[@] ps	DEF	J$^\pi$: from 1005.5γ (E2) to 3$^{(-)}$; 1485.2γ (E1) to 4$^+$. Other: (4) in 1981Ah03.
3644 *10*			B DE	J$^\pi$: (6$^+$) proposed in ^{40}Ca(^{36}Ar,α2pγ),^{58}Ni(^{14}N,pnγ).
3788.9 *6*	(6$^-$)		DEF	J$^\pi$: J from D+Q 264.8γ to (5$^-$), π from systematics in 1980Wa19. Other: (5) in 1981Ah03.
3915.4[c] *5*	7$^-$	<15[@] ps	B DEF	J$^\pi$: from 912.2γ E1 to 6$^+$, 691.5γ from 8$^+$.
4037.6[&] *5*	8$^+$	<4[@] ps	B DEF	J$^\pi$: from 1034.4γ E2 to 6$^+$; assumed E2 cascade member.

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Adopted Levels, Gammas (continued)

^{70}Se Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[‡]	XREF	Comments
4187.4[a] *8*	(8$^+$)		D	J^π: from 969.0γ to (6$^+$); assumed E2 cascade member.
4324.5 *9*			E	
4410.7 *6*			DE	
4607.0[b] *6*	8$^+$		B DE	J^π: (8,9$^+$) from R(DCO) in ^{40}Ca(^{36}Ar,α2pγ),^{58}Ni(^{14}N,pnγ), 1603.7γ to 6$^+$.
4896.7[d] *6*	(9$^-$)		DE	J^π: from 981.3γ to 7$^-$; 468.0γ to (8$^-$); assumed E2 cascade member.
4955.0 *12*			B E	J^π: (9) from 348.0γ to 8$^+$ suggested in ε decay (2000Pi15) but the placement of the γ transition is uncertain.
5205.8[&] *5*	(10$^+$)		B DE	J^π: from 1168.12γ to 8$^+$; assumed E2 cascade member.
5209.1[c] *6*	(9$^-$)		DE	J^π: from 1293.6γ to 7$^-$; assumed E2 cascade member.
5308.1[a] *10*	(10$^+$)		D	J^π: from 1120γ to (8$^+$); assumed E2 cascade member.
5693.2[b] *6*	(10$^+$)		B DE	J^π: from 1086.2γ to 8$^+$; assumed E2 cascade member.
5805.5[d] *6*	(11$^-$)		DE	J^π: from 908.7γ to (9$^-$); assumed E2 cascade member.
6017.0 *15*			B E	
6490.0[c] *6*	(11$^-$)		DE	J^π: from 1280.9γ to (9$^-$); assumed E2 cascade member.
6510.2[&] *5*	(12$^+$)		DE	J^π: from 1304.45γ to (10$^+$); assumed E2 cascade member.
6602[a] *5*	(12$^+$)		D	J^π: from 1294γ to (10$^+$); assumed E2 cascade member.
6873.0[d] *6*	(13$^-$)		DE	J^π: from 1967.5γ to (11$^-$); assumed E2 cascade member.
6956.9[b] *6*	(12$^+$)		DE	J^π: from 1263.6γ to (10$^+$); assumed E2 cascade member.
7305.8 *9*	(13$^-$)	1.6 ns *2*	E	$T_{1/2}$: quoted by 1989My01; generalized centroid-shift method. J^π: from 796.5γ to 12$^+$; 348.0γ to (12$^+$); proposed based on Weisskopf estimates in 1989My01.
7554.0[c] *7*	(13$^-$)		D	J^π: from 1064.0γ to (11$^-$); assumed E2 cascade member.
7940.8[&] *5*	(14$^+$)		DE	J^π: from 1430.6γ to 12$^+$; assumed E2 cascade member.
8017.7[d] *7*	(15$^-$)		D	J^π: from 1144.7γ to (13$^-$); assumed E2 cascade member.
8029[a] *5*	(14$^+$)		D	J^π: from 1427.2γ to (12$^+$); assumed E2 cascade member.
8316.3[b] *6*	(14$^+$)		D	J^π: from 1359.4γ to (12$^+$); assumed E2 cascade member.
8349.5 *13*			E	
8771.8[c] *8*	(15$^-$)		D	J^π: from 1217.8γ to (13$^-$); assumed E2 cascade member.
9430.3[b] *6*	(16$^+$)		D	J^π: from 1114.0γ to (14$^+$); assumed E2 cascade member.
9496.2[&] *6*	(16$^+$)		DE	J^π: from 1555.3γ to (14$^+$); assumed E2 cascade member.
9624.1[d] *7*	(17$^-$)		D	J^π: from 1606.4γ to (15$^-$); assumed E2 cascade member.
10084.1[c] *8*	(17$^-$)		D	J^π: from 1312.3γ to (15$^-$); assumed E2 cascade member.
10646.2[b] *6*	(18$^+$)		D	J^π: from 1215.9γ to 16$^+$; assumed E2 cascade member.
11120.5 *9*			D	
11268.5[&] *11*	(18$^+$)		D	J^π: from 1772.3γ to (16$^+$); assumed E2 cascade member.
11532.2[d] *10*	(19$^-$)		D	J^π: from 1908.1γ to (17$^-$); assumed E2 cascade member.
11778.5[c] *12*	(19$^-$)		D	J^π: from 1694.4γ to (17$^-$); assumed E2 cascade member.
12267.7[b] *7*	(20$^+$)		D	J^π: from 1621.5γ to (18$^+$); assumed E2 cascade member.
13160.5[&] *15*	(20$^+$)		D	J^π: from 1892γ to (18$^+$); assumed E2 cascade member.
13181.4[d] *11*	(21$^-$)		D	J^π: from 1649.2γ to (19$^-$); assumed E2 cascade member.
13727.0[c] *14*	(21$^-$)		D	J^π: from 1948.4γ to (19$^-$); assumed E2 cascade member.
14257.7[b] *11*	(22$^+$)		D	J^π: from 1990.0γ to (20$^+$); assumed E2 cascade member.
15251[d] *3*	(23$^-$)		D	J^π: from 2070γ to (21$^-$); assumed E2 cascade member.
15806[c] *7*	(23$^-$)		D	J^π: from 2079γ to (21$^-$); assumed E2 cascade member.
16490[b] *3*	(24$^+$)		D	J^π: from 2232γ to (22$^+$); assumed E2 cascade member.
17870[d] *4*	(25$^-$)		D	J^π: from 2618γ to (23$^-$); assumed E2 cascade member.
17966[c] *7*	(25$^-$)		D	J^π: from 2160γ to (23$^-$); assumed E2 cascade member.

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Adopted Levels, Gammas (continued)

^{70}Se Levels (continued)

E(level)[†]	J$^\pi$	XREF	Comments
19218[b] 5	(26$^+$)	D	J$^\pi$: from 2728γ to (24$^+$); assumed E2 cascade member.
20246[c] 8	(27$^-$)	D	J$^\pi$: from 2280γ to (25$^-$); assumed E2 cascade member.

[†] From a least-squares fit to Eγ′s, by evaluators. ΔEγ=1 keV is assumed when no uncertainty is available.
[‡] From recoil distance Doppler shift method (2008Lj01), unless otherwise noted.
[#] From recoil distance Doppler shift method (1986He17), using singles data.
[@] Effective lifetime from recoil distance method, not corrected for the side feedings (1986He17).
[&] Band(A): g.s. yrast band.
[a] Band(B): Band based on 1600, 2$^+$.
[b] Band(C): Band based on 4607, 8$^+$.
[c] Band(D): Band based on 3915, 7$^-$.
[d] Band(E): Band based on 4896, (9$^-$).

Adopted Levels, Gammas (continued)

$\gamma(^{70}Se)$

E_i(level)	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult. [&]	δ [d]	α [e]	Comments
944.52	2^+	944.51 *5*	100	0.0	0^+	E2		4.82×10^{-4}	α(K)=0.000429 *6*; α(L)=4.50×10^{-5} *7*; α(M)=7.00×10^{-6} *10*; α(N)=5.96×10^{-7} *9* B(E2)(W.u.)=19.7 *13*
1599.9	2^+	655.1 *5*	100 *21*	944.52	2^+	M1+E2 [a]	−1.0 +*1*−*2*	0.00109 *4*	α(K)=0.00097 *3*; α(L)=0.000103 *3*; α(M)=1.60×10^{-5} *5*; α(N)=1.36×10^{-6} *4* B(E2)(W.u.)=33 *14*; B(M1)(W.u.)=0.009 *4* δ: Other: 1.4 +*2.3*−*0.6* (1980Wa19).
		1600.1 *7*	25 *5*	0.0	0^+	E2		2.79×10^{-4}	α(K)=0.0001367 *20*; α(L)=1.414×10^{-5} *20*; α(M)=2.20×10^{-6} *3*; α(N)=1.88×10^{-7} *3* B(E2)(W.u.)=0.19 *8* Mult.: Q from $\gamma(\theta)$ in ^{58}Ni(^{14}N,pnγ),^{60}Ni(^{12}C,2nγ); M2 excluded by comparison to RUL.
2010.3	(0^+)	1065.8 [@] *3*	100 [@]	944.52	2^+	(E2)		3.63×10^{-4}	α(K)=0.000323 *5*; α(L)=3.38×10^{-5} *5*; α(M)=5.26×10^{-6} *8*; α(N)=4.48×10^{-7} *7*
2038.8	4^+	438.9 *5*	0.8 *7*	1599.9	2^+	[E2]		0.00415	α(K)=0.00368 *6*; α(L)=0.000400 *6*; α(M)=6.21×10^{-5} *9*; α(N)=5.20×10^{-6} *8* B(E2)(W.u.)=17 *15*
		1094.4 *1*	100 *3*	944.52	2^+	E2		3.41×10^{-4}	α(K)=0.000304 *5*; α(L)=3.18×10^{-5} *5*; α(M)=4.94×10^{-6} *7*; α(N)=4.22×10^{-7} *6* B(E2)(W.u.)=21.5 *18*
2382.5	4^+	782.6 *3*	100 *12*	1599.9	2^+	E2 [b]		7.71×10^{-4}	α(K)=0.000687 *10*; α(L)=7.25×10^{-5} *11*; α(M)=1.128×10^{-5} *16*; α(N)=9.57×10^{-7} *14* B(E2)(W.u.)>5.2
		1438.1 *7*	$8.\times10^1$ *5*	944.52	2^+	E2 [b]		2.54×10^{-4}	α(K)=0.0001692 *24*; α(L)=1.755×10^{-5} *25*; α(M)=2.73×10^{-6} *4*; α(N)=2.33×10^{-7} *4* B(E2)(W.u.)>0.20
2518.6	$3^{(-)}$	1574.1 *9*	100	944.52	2^+	D			δ: δ=−0.26 *15* (1981Ah03); 0.0 (1980Wa19).
2553.1		1608.6 [‡]	100 [#]	944.52	2^+				
3003.2	6^+	620.7 *9*	3 *1*	2382.5	4^+	[E2]		1.45×10^{-3}	α(K)=0.001291 *19*; α(L)=0.0001376 *21*; α(M)=2.14×10^{-5} *4*; α(N)=1.81×10^{-6} *3* B(E2)(W.u.)=8 *3*
		964.39 *5*	100 *4*	2038.8	4^+	E2		4.58×10^{-4}	α(K)=0.000408 *6*; α(L)=4.28×10^{-5} *6*; α(M)=6.66×10^{-6} *10*; α(N)=5.67×10^{-7} *8* B(E2)(W.u.)=29 *5*
3139.6		2195.0 [@] *3*	100 [@]	944.52	2^+				
3218.4	(6^+)	215 *5*	11 *7*	3003.2	6^+				
		835.9 *4*	100 *11*	2382.5	4^+				
3356.4		973.9 [‡]	100 [#]	2382.5	4^+				
3387.4	5^-	868.8 *4*	57 *9*	2518.6	$3^{(-)}$	[E2]		5.91×10^{-4}	α(K)=0.000526 *8*; α(L)=5.54×10^{-5} *8*; α(M)=8.61×10^{-6} *13*; α(N)=7.32×10^{-7} *11* B(E2)(W.u.)=4.0 *14*

$^{70}_{34}Se_{36}$-4

Adopted Levels, Gammas (continued)

$\gamma(^{70}Se)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.&	α[e]	Comments
3387.4	5^-	1348.6 4	100 12	2038.8	4^+	E1(+M2)[c]		δ: +0.12 with large error (1981Ah03); 0.0 (1980Wa19).
3524.1	(5^-)	1005.5 7	22 7	2518.6	$3^{(-)}$	(E2)[b]	4.15×10^{-4}	α(K)=0.000370 6; α(L)=3.87×10^{-5} 6; α(M)=6.02×10^{-6} 9; α(N)=5.13×10^{-7} 8 B(E2)(W.u.)>0.64 Mult.,δ: D+Q, −0.06 +9−2 (1981Ah03).
		1485.2 5	100 13	2038.8	4^+	(E1)[c]	3.29×10^{-4}	α(K)=8.00×10^{-5} 12; α(L)=8.22×10^{-6} 12; α(M)=1.278×10^{-6} 18; α(N)=1.095×10^{-7} 16 B(E1)(W.u.)>1.1×10^{-5}
3644		1261 10	100	2382.5	4^+			
3788.9	(6^-)	264.8 3	100	3524.1	(5^-)	D+Q		Mult.,δ: D+Q, 0.0<δ<3.7 (1980Wa19). Other: Q (1981Ah03).
3915.4	7^-	126.6 3	5.7 20	3788.9	(6^-)			
		528.0 2	28.7 20	3387.4	5^-	E2[b]	0.00233	α(K)=0.00207 3; α(L)=0.000223 4; α(M)=3.46×10^{-5} 5; α(N)=2.91×10^{-6} 4 B(E2)(W.u.)>11
		912.2 1	100 4	3003.2	6^+	E1	2.17×10^{-4}	α(K)=0.000194 3; α(L)=2.00×10^{-5} 3; α(M)=3.12×10^{-6} 5; α(N)=2.66×10^{-7} 4 B(E1)(W.u.)>2.6×10^{-5} Mult.,δ: E1+M2 with δ=−0.15 5 (1981Ah03), however, this results in an M2 strength which exceeds the RUL.
4037.6	8^+	1034.4 1	100	3003.2	6^+	E2	3.89×10^{-4}	α(K)=0.000346 5; α(L)=3.62×10^{-5} 5; α(M)=5.64×10^{-6} 8; α(N)=4.80×10^{-7} 7 B(E2)(W.u.)>7.0 Mult.: Q from R(DCO) in $^{58}Ni(^{14}N,pn\gamma)$,$^{60}Ni(^{12}C,2n\gamma)$; M2 excluded by comparison to RUL.
4187.4	(8^+)	969.0 6	100	3218.4	(6^+)			
4324.5		937.0‡		3387.4	5^-			
		1321.3‡		3003.2	6^+			
4410.7		495.3 3	100	3915.4	7^-			
4607.0	8^+	569 2	18 8	4037.6	8^+			
		691.5 6	56 8	3915.4	7^-			
		1603.7 6	100 12	3003.2	6^+			
4896.7	(9^-)	486.0 3	29 9	4410.7				
		981.3 2	100 7	3915.4	7^-			
4955.0		348.0[f]‡	100#	4607.0	8^+			
5205.8	(10^+)	1168.12 8	100	4037.6	8^+			
5209.1	(9^-)	1293.6 3	100	3915.4	7^-			
5308.1	(10^+)	1120.7 6	100	4187.4	(8^+)			
5693.2	(10^+)	1086.2 2	100 7	4607.0	8^+			
		1655.4 9	41 6	4037.6	8^+			
5805.5	(11^-)	908.7 2	100	4896.7	(9^-)			
6017.0		1062.0‡	100#	4955.0				

$^{70}_{34}Se_{36}$-5

Adopted Levels, Gammas (continued)

$\gamma(^{70}Se)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f
6490.0	(11−)	1280.9 2	100	5209.1	(9−)	9624.1	(17−)	1606.4 3	100	8017.7	(15−)
6510.2	(12+)	1304.45 9	100	5205.8	(10+)	10084.1	(17−)	1312.3 3	100	8771.8	(15−)
6602	(12+)	1294 5	100	5308.1	(10+)	10646.2	(18+)	1215.9 2	100	9430.3	(16+)
6873.0	(13−)	1067.5 2	100	5805.5	(11−)	11120.5		1624.3 6	100	9496.2	(16+)
6956.9	(12+)	1263.6 3	100 10	5693.2	(10+)	11268.5	(18+)	1772.3 9	100	9496.2	(16+)
		1750.9 9	37 5	5205.8	(10+)	11532.2	(19−)	1908.1 7	100	9624.1	(17−)
7305.8	(13−)	348.0[f,‡]		6956.9	(12+)	11778.5	(19−)	1694.4 9	100	10084.1	(17−)
		796.5[‡]		6510.2	(12+)	12267.7	(20+)	1621.5 3	100	10646.2	(18+)
7554.0	(13−)	1064.0 3	100	6490.0	(11−)	13160.5	(20+)	1892 1	100	11268.5	(18+)
7940.8	(14+)	1430.6 1	100	6510.2	(12+)	13181.4	(21−)	1649.2 4	100	11532.2	(19−)
8017.7	(15−)	1144.7 2	100	6873.0	(13−)	13727.0	(21−)	1948.4 6	100	11778.5	(19−)
8029	(14+)	1427.2 9	100	6602	(12+)	14257.7	(22+)	1990.0 9	100	12267.7	(20+)
8316.3	(14+)	1359.4 3	100 8	6956.9	(12+)	15251	(23−)	2070 3	100	13181.4	(21−)
		1806.0 6	36 5	6510.2	(12+)	15806	(23−)	2079 7	100	13727.0	(21−)
8349.5		1043.7[‡]	100[#]	7305.8	(13−)	16490	(24+)	2232 3	100	14257.7	(22+)
8771.8	(15−)	1217.8 3	100	7554.0	(13−)	17870	(25−)	2618 2	100	15251	(23−)
9430.3	(16+)	1114.0 3	100 10	8316.3	(14+)	17966	(25−)	2160 2	100	15806	(23−)
		1489.4 3	63 7	7940.8	(14+)	19218	(26+)	2728 4	100	16490	(24+)
9496.2	(16+)	1555.3 3	100	7940.8	(14+)	20246	(27−)	2280 4	100	17966	(25−)

† From $^{40}Ca(^{40}Ca,2\alpha 2p\gamma)$, unless otherwise noted.

‡ From $^{40}Ca(^{36}Ar,\alpha 2p\gamma)$.

From $^{40}Ca(^{36}Ar,\alpha 2p\gamma)$.

@ From $^{58}Ni(^{14}N,pn\gamma)$, $^{60}Ni(^{12}C,2n\gamma)$.

& From $\gamma(\theta)$, R_{DCO} and γ-deexcitation pattern in $^{58}Ni(^{14}N,pn\gamma)$, $^{60}Ni(^{12}C,2n\gamma)$ (1981Ah03) or $\gamma(\theta)$ and linear polarization measurements in $^{60}Ni(^{12}C,2n\gamma)$ (1980Wa19), unless otherwise stated.

a D+Q from $\gamma(\theta)$ in $^{58}Ni(^{14}N,pn\gamma)$,$^{60}Ni(^{12}C,2n\gamma)$; $\Delta\pi$= no from level scheme.

b Q from $\gamma(\theta)$ in $^{58}Ni(^{14}N,pn\gamma)$,$^{60}Ni(^{12}C,2n\gamma)$; M2 excluded by comparison to RUL.

c D+Q (or D) from $\gamma(\theta)$ in $^{58}Ni(^{14}N,pn\gamma)$,$^{60}Ni(^{12}C,2n\gamma)$; $\Delta\pi$= yes from level scheme.

d From $\gamma(\theta)$ in $^{58}Ni(^{14}N,pn\gamma)$ (1981Ah03).

e Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

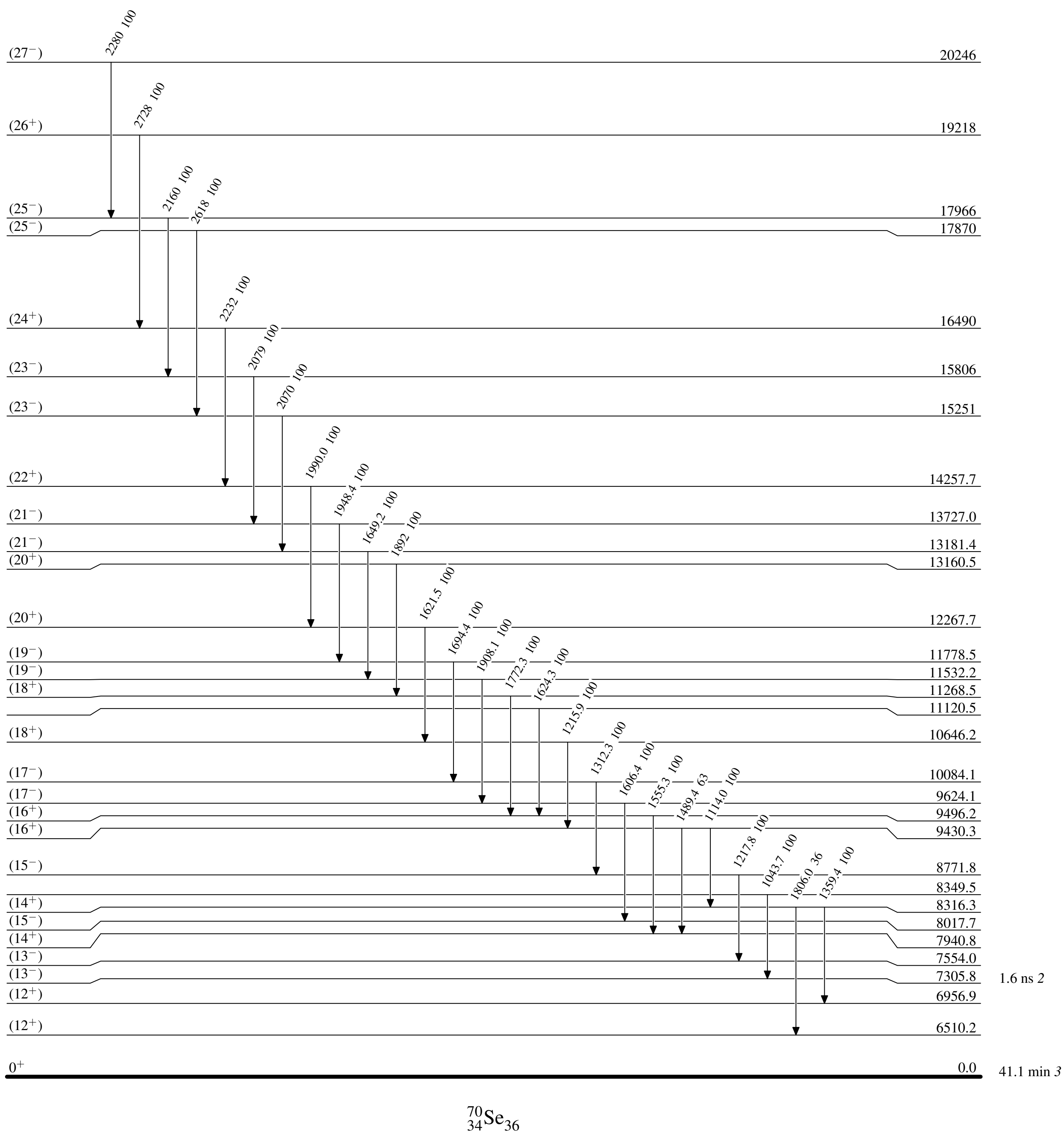
f Multiply placed.

$^{70}_{34}Se_{36}$-6

Adopted Levels, Gammas

Level Scheme

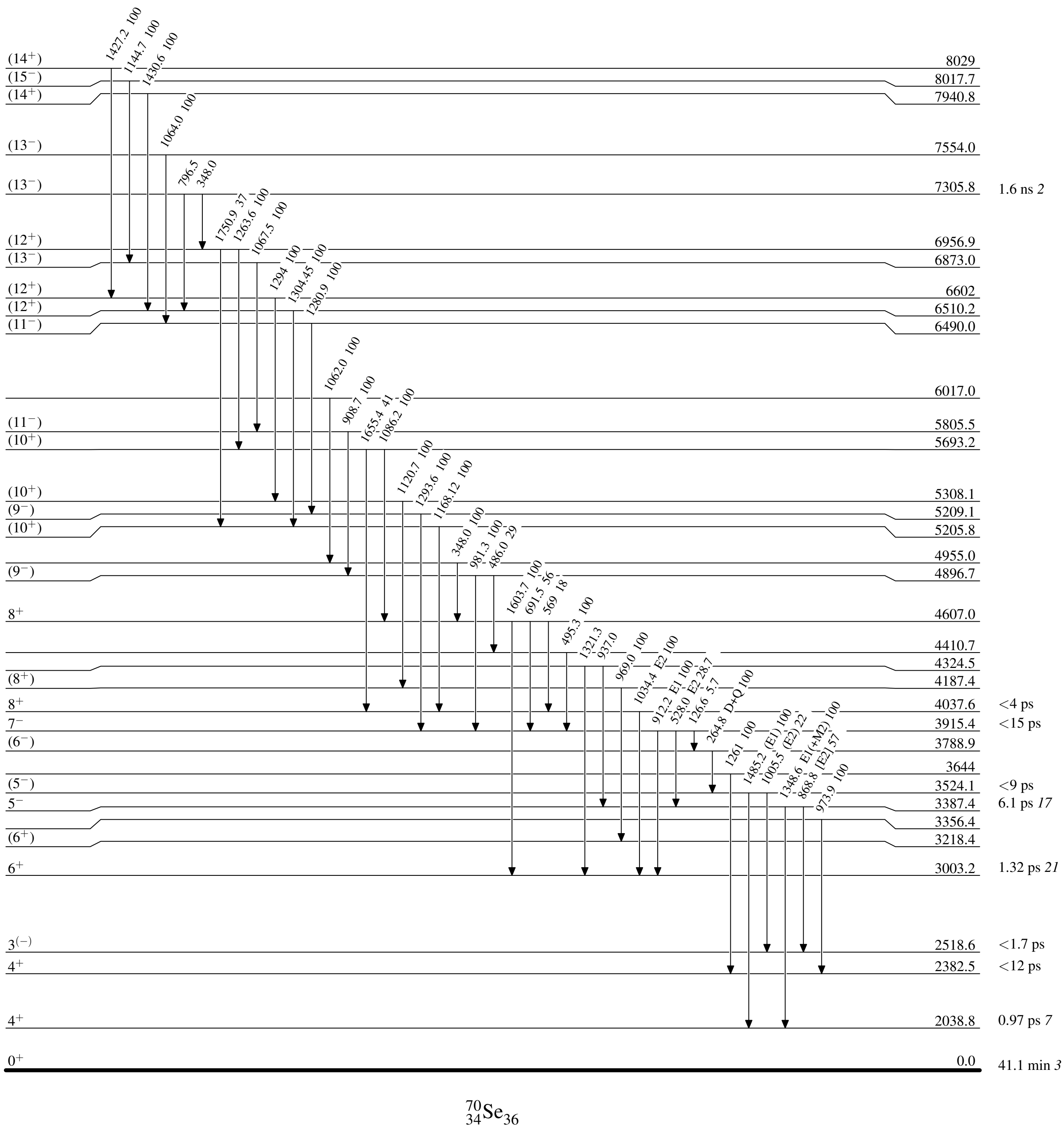
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

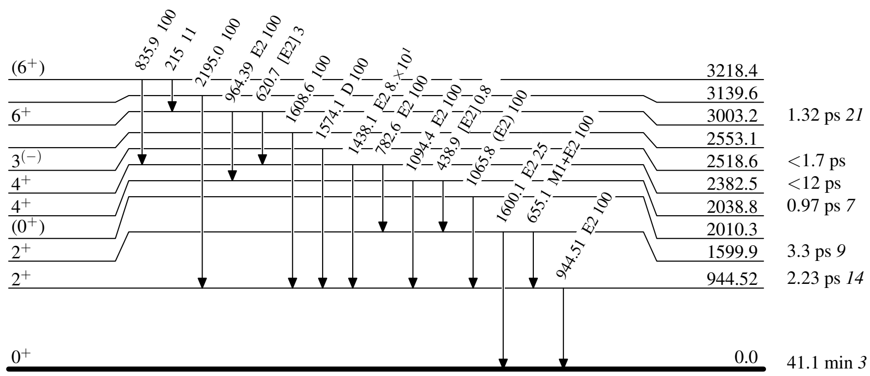
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

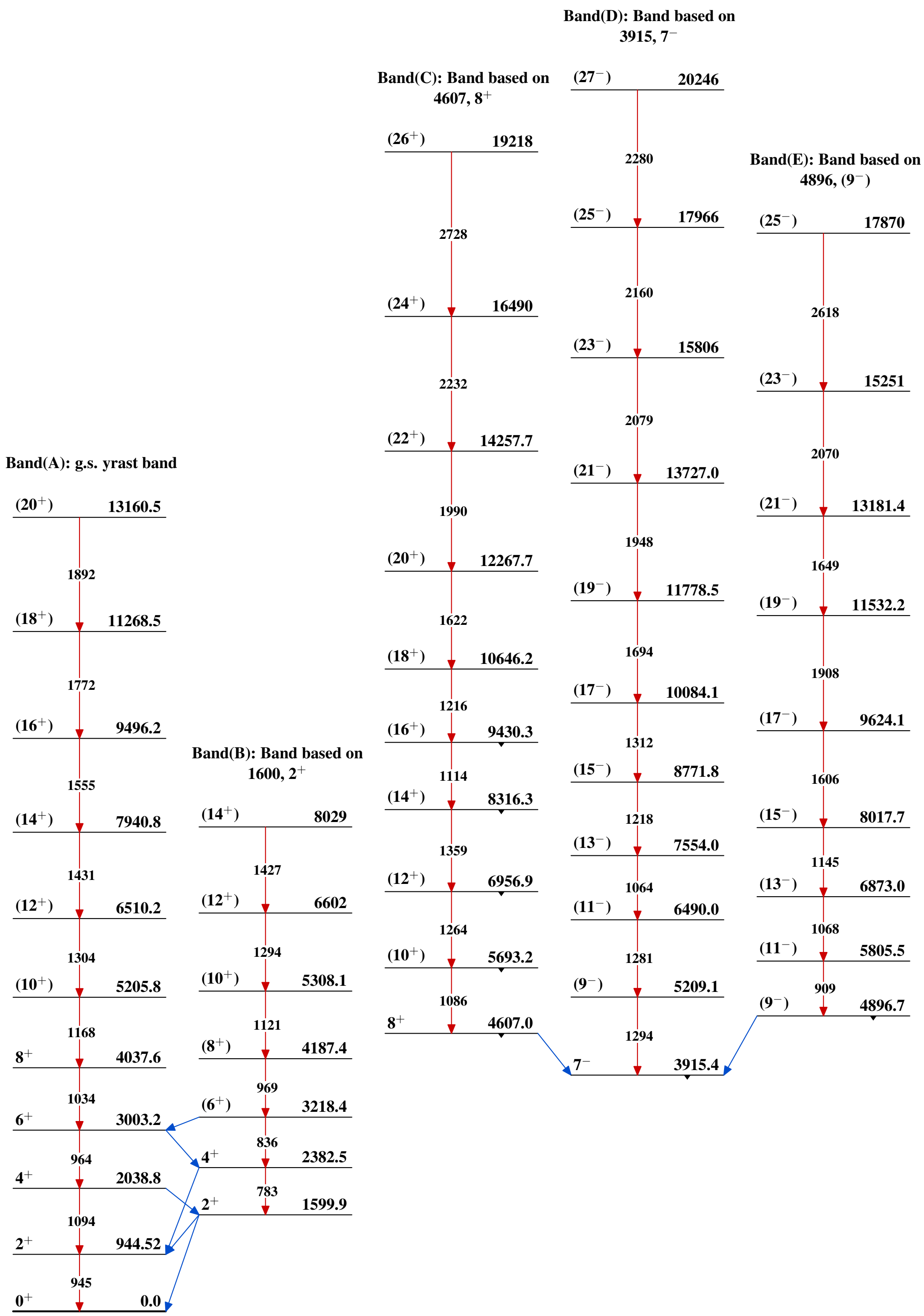
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{70}_{34}Se_{36}$

Adopted Levels, Gammas



$^{70}_{34}Se_{36}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 111,1 (2010)	1-May-2009

Q(β^-)=−8801 *7*; S(n)=12793 *4*; S(p)=7264 *5*; Q(α)=−3314 *3* 2012Wa38
Note: Current evaluation has used the following Q record −8799 7 *12796* 7 *7265* 5 −3315 7 2009AuZZ.

^{72}Se Levels

Cross Reference (XREF) Flags

A	^{72}Br ε decay	D	^{74}Se(p,t)
B	^{73}Kr εp decay (27.3 s)	E	(HI,xnγ)
C	^{70}Ge(α,2nγ), ^{72}Ge(α,4nγ)	F	^{54}Fe(^{24}Mg,α2pγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[&]	XREF	Comments
0[a]	0$^+$	8.40 d *8*	ABCDEF	%ε=100 T$_{1/2}$: from 1958Cu91. Other: 9.7 d (1950Ho26).
862.07[a] *8*	2$^+$[#]	2.82 ps *20*	ABCDEF	
937.22[b] *15*	0$^+$[#]	17.5 ns *17*	ABCDEF	T$_{1/2}$: unweighted average of delayed coincidence measurements: 19.3 ns 4 from ^{70}Ge(α,2nγ) (1974Dr02) and 15.8 ns *10* from ^{72}Br ε decay (1974Ha04).
1316.68 *8*	2$^+$	8.7 ps *3*	AB E	J$^\pi$: from $\gamma(\theta)$ in (HI,xnγ) and γ to 0$^+$.
1636.86[a] *12*	4$^+$	2.07 ps *16*	A C EF	J$^\pi$: stretched E2 γ to 2$^+$.
1876.23 *17*	(2,4)		A E	
1998.93[b] *13*	2$^+$		A EF	J$^\pi$: from γ's to 0$^+$ and 2$^+$, and $\gamma(\theta)$ (HI,xnγ).
2150.1 *8*	(2$^+$)		A	J$^\pi$: γ's to 0$^+$, 2$^+$, and 4$^+$.
2293.69 *11*	(2)	<1.0 ps	E	
2371.50 *21*			A E	E(level): may be a doublet: J^π=(2)$^+$ from γ to 0$^+$ and log *ft*=6.34 from 3$^+$, J=(3) from $\gamma(\theta)$ in (HI,xnγ).
2405.74 *21*	3$^-$[#]	<1.0 ps	DE	
2433.76[c] *10*	3$^-$[@]	<1.0 ps	A EF	
2466.77[a] *15*	6$^+$	1.24 ps *8*	C EF	J$^\pi$: stretched E2 γ to 4$^+$.
2586.35 *16*	(3)		A E	
2843	5$^-$[#]		D	
2929	3$^-$[#]		D	
2965.75 *23*			A	
3124.07 *21*	(4$^+$)		A DE	J$^\pi$: L(p,t)=4 at 3138 *20*. γ's to 2$^+$, (3).
3173.20[c] *12*	5$^-$[@]	<1.0 ps	EF	
3213.51 *16*	(2$^+$,3,4$^+$)		E	J$^\pi$: γ's to (2$^+$) and (4$^+$).
3226.2 *3*	(2,3,4$^+$)		A	J$^\pi$: γ's to 2$^+$ and log *ft*=6.43 from 3$^+$.
3232.09 *13*			E	
3239.3 *9*			A	
3349.91 *13*	5$^-$[@]	<1.0 ps	DE	J$^\pi$: L(p,t)=(5) for E≈3340.
3382.6 *3*			E	
3424.77[a] *25*	8$^+$	0.51 ps *5*	EF	J$^\pi$: stretched E2 γ to 6$^+$.
3450	2$^+$[#]		D	
3521.95 *14*	6$^-$[@]	2.9 ps *3*	E	
3762	4$^+$[#]		D	
3769.99 *14*	7$^-$[@]	2.8 ps *2*	EF	
3917.25[c] *15*	7$^-$[@]	0.79 ps *17*	EF	
4092.8 *3*			E	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{72}Se Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[&]	XREF	Comments
4217.7 *3*			E	
4310	6^+[#]		D	
4325.7 *4*			E	J^{π}: π=− from placement in the band.
4504.3[a] *3*	10^+	0.22 ps *2*	EF	J^{π}: stretched E2 γ to 8^+.
4713.20 *25*			E	
4762.83[c] *19*	(9^-)[@]	0.59 ps *8*	EF	
5709.7[a] *3*	12^+	0.14 ps *2*	EF	J^{π}: stretched E2 γ to 10^+.
5830.8[c] *9*	(11^-)[@]	0.83 ps *10*	EF	
6686.5 *9*	(11^-)[@]		EF	
7038.1[a] *6*	14^+	0.097 ps *8*	EF	J^{π}: stretched E2 γ to 12^+.
7041.9[c] *12*	(13^-)[@]	<0.69 ps	EF	
7190.7 *10*	(12^-)[@]		EF	
7795.7 *14*	(13^-)[@]		EF	
8089.7[c] *12*	(14^-)[@]		EF	
8495.1[a] *12*	16^+	0.040 ps *7*	EF	J^{π}: stretched E2 γ to 14^+.
10095.1[a] *15*	18^+	0.042 ps *10*	EF	J^{π}: stretched E2 γ to 16^+.
11832.2[a] *18*	20^+	0.069 ps *14*	EF	J^{π}: stretched E2 γ to 18^+.
13742.2[a] *21*	22^+	<0.05 ps	EF	J^{π}: stretched E2 γ to 20^+.
15896.2[a] *23*	24^+	<0.3 ps	EF	J^{π}: stretched E2 γ to 22^+.
18216[a] *3*	(26^+)	<0.3 ps	E	E(level): 1991Ch14 observed a 26^+ level at 18184 *3* which decays to the 24^+ level. J^{π}: stretched (E2) γ to 24^+.
20798[a] *3*	(28^+)	<0.3 ps	E	J^{π}: stretched (E2) γ to (26^+).

[†] Levels not connected to any other level are taken from ^{74}Se(p,t); other level energies are calculated from the adopted Eγ data.
[‡] From $\gamma(\theta)$ in (HI,xnγ) and γ decay mode, except as noted.
[#] From L(p,t).
[@] From DCO ratios and systematics (1989My01).
[&] From (HI,xnγ), except as noted.
[a] Band(A): g.s. band.
[b] Band(B): second 0^+ band.
[c] Band(C): negative parity.

$\gamma(^{72}$Se)

E$_i$(level)	J$^\pi_i$	E$_\gamma$[†]	I$_\gamma$	E$_f$	J$^\pi_f$	Mult.[‡]	α[@]	Comments
862.07	2$^+$	862.03 12	100	0	0$^+$	E2	6.03×10^{-4}	α(K)=0.000537 8; α(L)=5.65×10^{-5} 8; α(M)=8.79×10^{-6} 13; α(N)=7.47×10^{-7} 11; α(N+..)=7.47×10^{-7} 11 B(E2)(W.u.)=23.7 17
937.22	0$^+$	75 2		862.07	2$^+$	[E2]	2.4 3	α(K)=2.05 22; α(L)=0.32 4; α(M)=0.050 6; α(N)=0.0036 5; α(N+..)=0.0036 5 Mult.: from adopted J^π values. I(γ+ce)=100 17. B(E2)(W.u.)=162 28.
		937		0	0$^+$	E0		Mult.: from ce data in (α,4nγ). I(γ+ce)=37 17.
1316.68	2$^+$	379.55 23	35 2	937.22	0$^+$	[E2]	0.00666	α(K)=0.00591 9; α(L)=0.000648 10; α(M)=0.0001006 15; α(N)=8.38×10^{-6} 12 α(N+..)=8.38×10^{-6} 12 B(E2)(W.u.)=77 6
		454.70 10	76 5	862.07	2$^+$			
		1316.70 10	100 6	0	0$^+$	E2	2.60×10^{-4}	α(K)=0.000203 3; α(L)=2.11×10^{-5} 3; α(M)=3.28×10^{-6} 5; α(N)=2.81×10^{-7} 4; α(N+..)=3.20×10^{-5} 5 B(E2)(W.u.)=0.44 4
1636.86	4$^+$	774.73 17	100	862.07	2$^+$	E2	7.92×10^{-4}	α(K)=0.000705 10; α(L)=7.45×10^{-5} 11; α(M)=1.158×10^{-5} 17; α(N)=9.83×10^{-7} 14 α(N+..)=9.83×10^{-7} 14 B(E2)(W.u.)=55 5
1876.23	(2,4)	559.34 24	100 6	1316.68	2$^+$			
		1014.0 8	27 14	862.07	2$^+$			
1998.93	2$^+$	1061.69 10	79 7	937.22	0$^+$	[E2]	3.66×10^{-4}	α(K)=0.000326 5; α(L)=3.41×10^{-5} 5; α(M)=5.30×10^{-6} 8; α(N)=4.52×10^{-7} 7; α(N+..)=4.52×10^{-7} 7
		1136.87 12	100 10	862.07	2$^+$			
2150.1	(2$^+$)	512[&] 2	100 40	1636.86	4$^+$			
		832 2	100 40	1316.68	2$^+$			
		2150.7 10	48 14	0	0$^+$			
2293.69	(2)	977.1 1	100 8	1316.68	2$^+$			
		1431.2 2	87 3	862.07	2$^+$			
2371.50		1054.7 3	50 8	1316.68	2$^+$			
		1433.6 10	13 5	937.22	0$^+$			
		1509.8 4	44 7	862.07	2$^+$			
		2371.9 7	100 10	0	0$^+$			
2405.74	3$^-$	1088.9 3	100	1316.68	2$^+$	[E1]	1.55×10^{-4}	α(K)=0.0001380 20; α(L)=1.422×10^{-5} 20; α(M)=2.21×10^{-6} 3; α(N+..)=1.89×10^{-7} 3 B(E1)(W.u.)>0.00030
2433.76	3$^-$	1117.2 1	25.0 19	1316.68	2$^+$			
		1571.58 10	100 5	862.07	2$^+$			
		2432.7 8	33 7	0	0$^+$			
2466.77	6$^+$	830.1 2	100	1636.86	4$^+$	E2	6.63×10^{-4}	α(K)=0.000590 9; α(L)=6.22×10^{-5} 9; α(M)=9.67×10^{-6} 14;

From ENSDF

$^{72}_{34}$Se$_{38}$-3

Adopted Levels, Gammas (continued)

$\gamma(^{72}Se)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ	E_f	J^{π}_f	Mult.[‡]	α[@]	Comments
								α(N)=8.22×10^{-7} *12*; α(N+..)=8.22×10^{-7} *12* B(E2)(W.u.)=65 *5*
2586.35	(3)	710.12 *18*	47 *10*	1876.23	(2,4)			
		1269.5 *5*	24 *12*	1316.68	2^+			
		1724.43 *19*	100 *8*	862.07	2^+			
2965.75		379.9[&] *3*	≤100	2586.35	(3)			
		1089.2[&] *3*	≤88	1876.23	(2,4)			
		1648.5 *5*	43 *12*	1316.68	2^+			
3124.07	(4^+)	537.6 *3*	24 *8*	2586.35	(3)			
		752.8 *4*	55 *8*	2371.50				
		1125.1 *3*	100 *11*	1998.93	2^+			
		1807.4 *6*	33 *7*	1316.68	2^+			
3173.20	5^-	739.5 *1*	18 *3*	2433.76	3^-			
		879.3 *2*	≤13	2293.69	(2)			
		1536.1 *3*	100 *4*	1636.86	4^+			
3213.51	(2^+,3,4^+)	807.7 *2*	100 *18*	2405.74	3^-			
		920.0 *2*	36 *9*	2293.69	(2)			
		1576.5 *2*	91 *18*	1636.86	4^+			
3226.2	(2,3,4^+)	1227.3 *4*	47 *19*	1998.93	2^+			
		1349.9 *3*	100 *19*	1876.23	(2,4)			
		1909.4 *7*	59 *16*	1316.68	2^+			
3232.09		798.3 *1*	92 *8*	2433.76	3^-			
		1595.3 *2*	100 *15*	1636.86	4^+			
3239.3		1089.2 *3*	100	2150.1	(2^+)			
3349.91	5^-	916.1 *2*	11.6 *23*	2433.76	3^-			
		1713.0 *1*	100 *7*	1636.86	4^+			
3382.6		1088.9 *3*	100	2293.69	(2)			
3424.77	8^+	958.0 *2*	100	2466.77	6^+	E2	4.66×10^{-4}	α(K)=0.000415 *6*; α(L)=4.35×10^{-5} *6*; α(M)=6.77×10^{-6} *10*; α(N)=5.76×10^{-7} *8*; α(N+..)=5.76×10^{-7} *8* B(E2)(W.u.)=77 *8*
3521.95	6^-	172.0 *1*	45 *3*	3349.91	5^-			
		348.8 *1*	100 *3*	3173.20	5^-			
3769.99	7^-	248.1		3521.95	6^-			
		596.7 *1*	39 *3*	3173.20	5^-			
		1303.3 *1*	100 *3*	2466.77	6^+			
3917.25	7^-	744.1 *1*	100 *9*	3173.20	5^-			
		1450.3 *2*	78 *22*	2466.77	6^+			
4092.8		879.3 *2*	100	3213.51	(2^+,3,4^+)			
4217.7		1750.9 *2*	100	2466.77	6^+			
4325.7		555.7 *4*	100	3769.99	7^-			
4504.3	10^+	1079.5 *1*	100	3424.77	8^+	E2	3.52×10^{-4}	α(K)=0.000314 *5*; α(L)=3.28×10^{-5} *5*; α(M)=5.10×10^{-6} *8*;

$\gamma(^{72}Se)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ	E_f	J^π_f	Mult.‡	α@	Comments
								α(N)=4.35×10^{-7} *6*; α(N+..)=4.35×10^{-7} *6* B(E2)(W.u.)=99 *9*
4713.20		943.2 *2*	100	3769.99	7^-			
4762.83	(9^-)	845.6 *2*	100 *13*	3917.25	7^-			
		992.8 *2*	38 *13*	3769.99	7^-			
		1338.3		3424.77	8^+			
5709.7	12^+	1205.4 *2*	100	4504.3	10^+	E2	2.85×10^{-4}	α(K)=0.000246 *4*; α(L)=2.56×10^{-5} *4*; α(M)=3.98×10^{-6} *6*; α(N)=3.40×10^{-7} *5*; α(N+..)=9.54×10^{-6} *14* B(E2)(W.u.)=89 *13*
5830.8	(11^-)	1068.0	100	4762.83	(9^-)			
6686.5	(11^-)	1923.6	100	4762.83	(9^-)			
7038.1	14^+	1328.4 *5*	100	5709.7	12^+	E2	2.58×10^{-4}	α(K)=0.000199 *3*; α(L)=2.07×10^{-5} *3*; α(M)=3.22×10^{-6} *5*; α(N)=2.75×10^{-7} *4*; α(N+..)=3.48×10^{-5} *5* B(E2)(W.u.)=79 *7*
7041.9	(13^-)	1211.0	100	5830.8	(11^-)			
7190.7	(12^-)	504.2		6686.5	(11^-)			
		1359.8		5830.8	(11^-)			
7795.7	(13^-)	605.0	100	7190.7	(12^-)			
8089.7	(14^-)	899.0		7190.7	(12^-)			
		1047.8		7041.9	(13^-)			
8495.1	16^+	1457	100	7038.1	14^+	E2#	2.55×10^{-4}	α(K)=0.0001648 *23*; α(L)=1.708×10^{-5} *24*; α(M)=2.66×10^{-6} *4*; α(N)=2.27×10^{-7} *4* α(N+..)=7.05×10^{-5} *10* B(E2)(W.u.)=121 *22*
10095.1	18^+	1600	100	8495.1	16^+	E2#	2.79×10^{-4}	α(K)=0.0001367 *20*; α(L)=1.414×10^{-5} *20*; α(M)=2.20×10^{-6} *3*; α(N)=1.88×10^{-7} *3* α(N+..)=0.0001262 *18* B(E2)(W.u.)=72 *18*
11832.2	20^+	1737	100	10095.1	18^+	E2#	3.17×10^{-4}	α(K)=0.0001165 *17*; α(L)=1.204×10^{-5} *17*; α(M)=1.87×10^{-6} *3*; α(N)=1.603×10^{-7} *23* α(N+..)=0.000186 *3* B(E2)(W.u.)=29 *6*
13742.2	22^+	1910	100	11832.2	20^+	E2#	3.75×10^{-4}	α(K)=9.74×10^{-5} *14*; α(L)=1.005×10^{-5} *14*; α(M)=1.563×10^{-6} *22*; α(N)=1.339×10^{-7} *19* α(N+..)=0.000266 *4* B(E2)(W.u.)>25
15896.2	24^+	2154	100	13742.2	22^+	E2#	4.72×10^{-4}	α(K)=7.82×10^{-5} *11*; α(L)=8.06×10^{-6} *12*; α(M)=1.253×10^{-6} *18*; α(N)=1.074×10^{-7} *15* α(N+..)=0.000385 *6* B(E2)(W.u.)>2.3
18216	(26^+)	2320	100	15896.2	24^+	(E2)#	5.43×10^{-4}	α(K)=6.86×10^{-5} *10*; α(L)=7.05×10^{-6} *10*; α(M)=1.097×10^{-6} *16*; α(N)=9.41×10^{-8} *14*

$^{72}_{34}Se_{38}$-5

$\gamma(^{72}Se)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}	E_f	J^{π}_f	Mult.[‡]	α[@]	Comments
								α(N+..)=0.000466 *7* B(E2)(W.u.)>1.6
20798	(28^+)	2582	100	18216	(26^+)	(E2)[#]	6.54×10^{-4}	α(K)=5.70×10^{-5} *8*; α(L)=5.86×10^{-6} *9*; α(M)=9.11×10^{-7} *13*; α(N)=7.81×10^{-8} *11*; α(N+..)=0.000591 *9* B(E2)(W.u.)>0.92

[†] γ data from levels above 3.3 MeV are from (HI,xnγ); for other γ radiations, data are from ^{72}Br ε decay and (HI,xnγ); averages have been calculated where possible.

[‡] Mult=E2 from $\gamma(\theta)$ in (HI,xnγ) and RUL, except as noted.

[#] Stretched E2 transitions from DCO ratios ≈1, (HI,xnγ).

[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

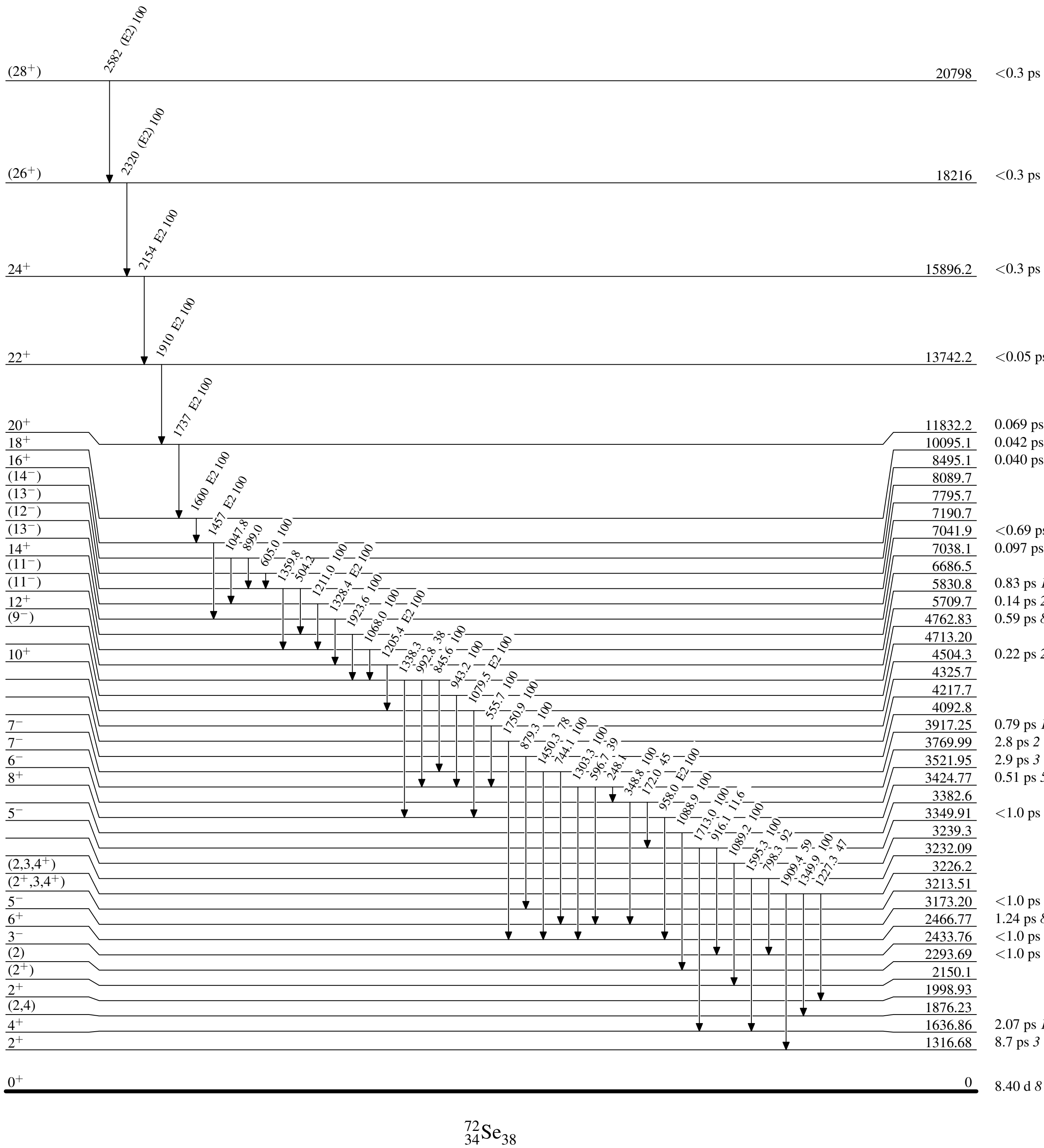
[&] Placement of transition in the level scheme is uncertain.

$^{72}_{34}Se_{38}$-6

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



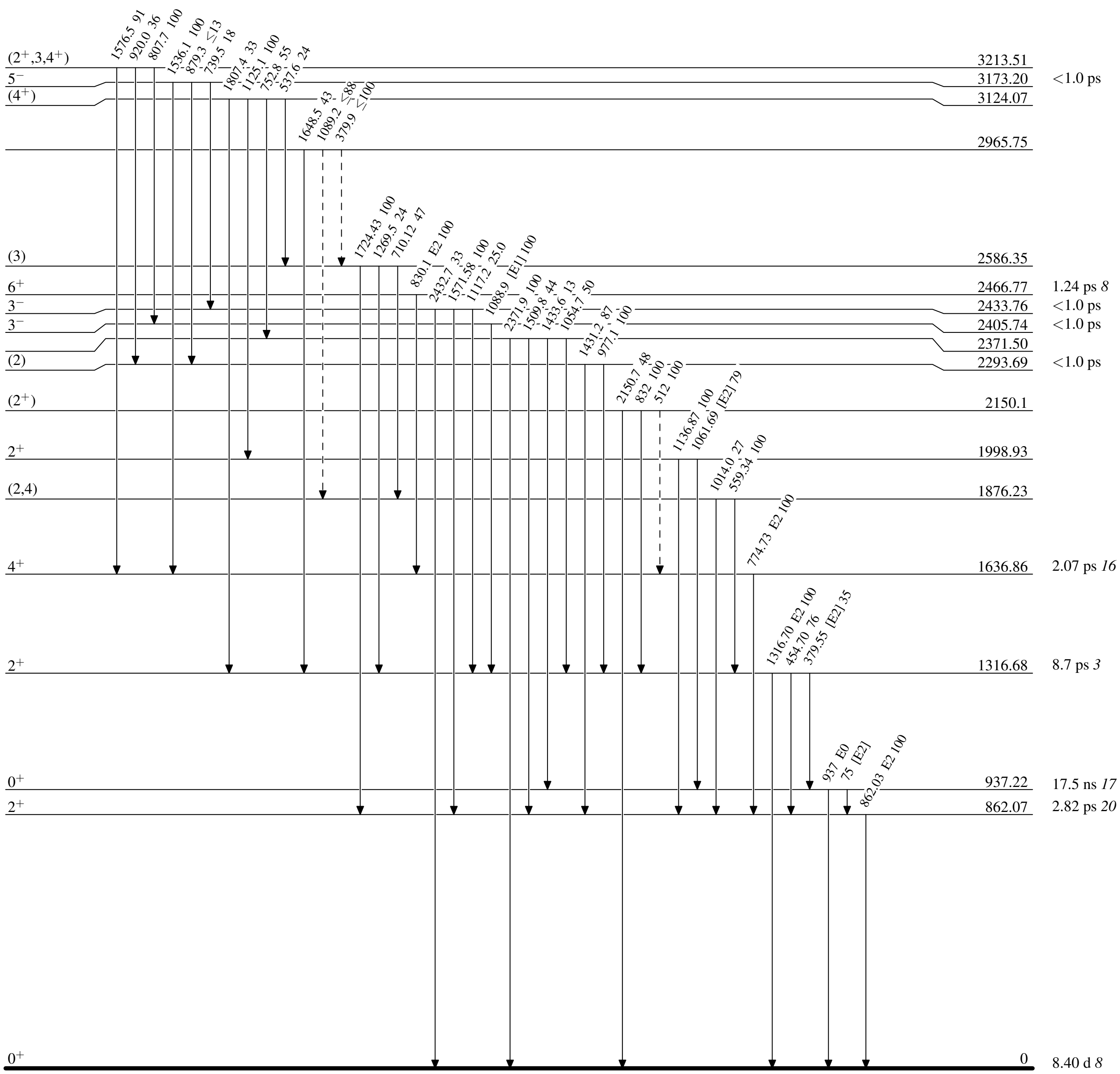
Adopted Levels, Gammas

Legend

Level Scheme (continued)

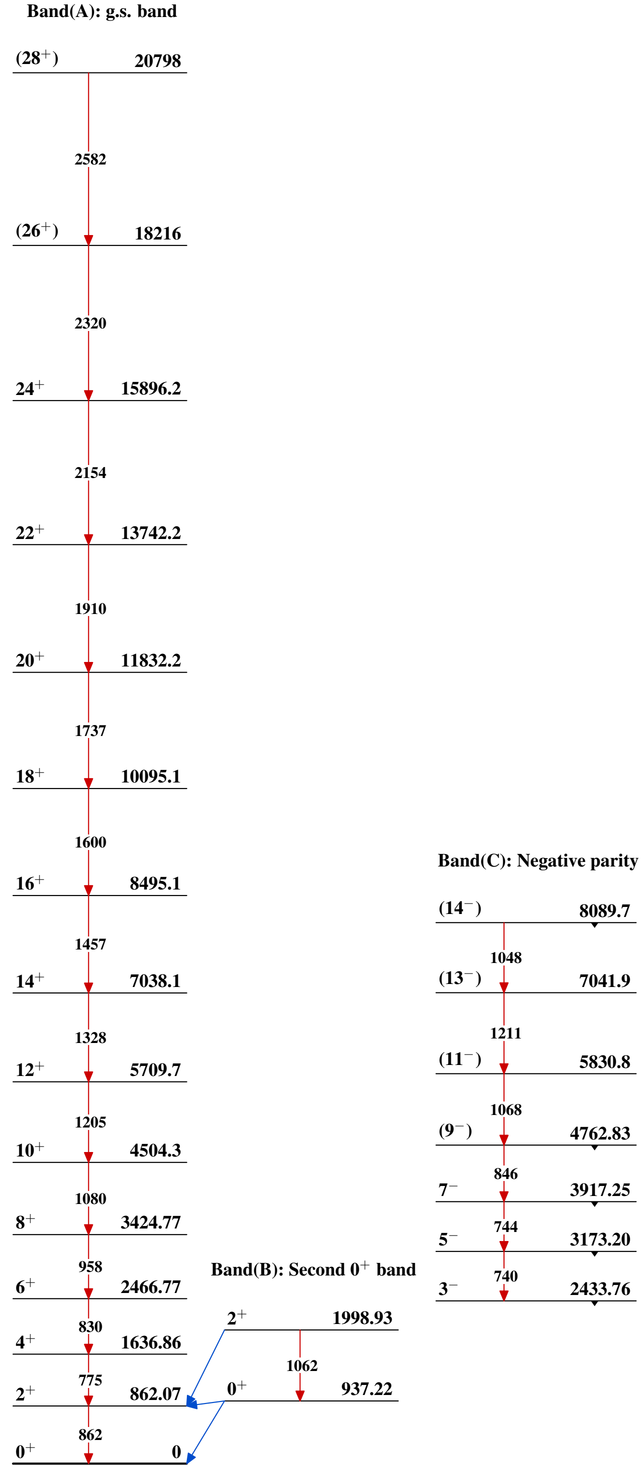
Intensities: Relative photon branching from each level

- - - - - ► γ Decay (Uncertain)



$^{72}_{34}Se_{38}$

Adopted Levels, Gammas



$^{72}_{34}Se_{38}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Ameenah R. Farhan	NDS 107,1923 (2006)	30-Apr-2006

Q(β^-)=−6925 *6*; S(n)=12057 *8*; S(p)=8549 *4*; Q(α)=−4076.3 *9* 2012Wa38
Note: Current evaluation has used the following Q record −6907 15 *12066* 11 *8545* 4 −4074.5 *19* 2003Au03.
Mass measurements: 1985El01, 1977De20, 1963Ri07.
Additional information 1.
Nuclear structure calculations (levels): 2005Da31.

^{74}Se Levels

Cross Reference (XREF) Flags

A	^{74}As β^- decay (17.77 d)	F	^{65}Cu(^{12}C,p2nγ)	K	Coulomb excitation
B	^{74}Br ε decay (25.4 min)	G	^{70}Ge(α,γ)	L	^{75}As(p,2nγ)
C	^{74}Br ε decay (46 min)	H	^{72}Ge(^{3}He,n)	M	^{76}Se(p,t)
D	^{58}Ni(^{19}F,3pγ)	I	^{72}Ge(^{16}O,^{14}C)		
E	^{64}Ni(^{12}C,2nγ),^{60}Ni(^{16}O,2pγ)	J	^{74}Se(p,p′)		

E(level)[†‡]	J$^\pi$[@]	$T_{1/2}$[#]	XREF	Comments
0.0[f]	0$^+$	stable	ABCDEFGHIJKLM	%(ε)(β^+)=?, %(ε)(ε)=? (see 1993Hy02 for experimental study of double β decay). <r^2>$^{1/2}$=4.070 fm *20* (2004An14). J$^\pi$: no hyperfine structure observed in microwave spectroscopy (1950Ge05, 1949St07), consistent with J=0.
634.74[f] *6*	2$^+$	7.08 ps *9*	ABCDEFG IJKLM	μ=0.86 *5* (1998Sp03) Q=−0.36 *7* (1989Ra17,1978Le22) μ: projectile excitation and transient-field technique (1998Sp03). See also 2005St24 compilation. Q: from Coul. ex. (1978Le22). See also 2005St24 compilation. β_2=0.337 (from (^{16}O,^{14}C)), 0.26 *4* (from (pol p,p′)). βR=1.38 *14* (from (p,p′)). J$^\pi$: L(pol p,p′)=L(p,t)=2. $T_{1/2}$: from B(E2)=0.388 *5* in Coul. ex. other: 7.4 ps 6 (DSA method in in-beam γ). 2001Ra27 adopted 7.08 ps *15*.
853.83 *9*	0$^+$	0.75 ns *5*	BC EFG JKLM	J$^\pi$: (219γ)(635γ)(θ) in ^{74}Br ε (46 min). L(p,p′)=L(p,t)=0. $T_{1/2}$: from B(E2) in Coul. ex. others: 0.83 ns *14* ($\gamma\gamma$(t) in ^{74}Br ε (25.4 min)), 0.52 ns *6* (centroid-shift in (p,p′)).
1269.01[h] *6*	2$^+$	4.0 ps *11*	ABCDEFG JKLM	μ=1.10 *18* (1998Sp03) XREF: M(1265). μ: projectile excitation and transient-field technique (1998Sp03). See also 2005St24 compilation. βR=0.23 *3* (from (p,p′)). J$^\pi$: L(p,p′)=L(p,t)=2. $T_{1/2}$: other: 3.3 ps *15* (Coul. ex.).
1363.17[f] *7*	4$^+$	1.86 ps *8*	CDEFG JKLM	μ=2.0 *4* (1998Sp03) μ: projectile excitation and transient-field technique (1998Sp03). See also 2005St24 compilation. β_4=0.019 *8* (from (pol p, p′)). βR=0.09 *1* (from (p,p′)). J$^\pi$: L(p,t)=L(pol p,p′)=4. $T_{1/2}$: from B(E2) in Coul. ex. other: 2.73 ps *20* (from 1979Ki17 and 1989Ad01, see ^{58}Ni(^{19}F,3pγ) dataset).
1657.47 *10*	(0$^+$)		B E G	J$^\pi$: γ to 2$^+$. No γ's to 0$^+$ and 4$^+$.

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Adopted Levels, Gammas (continued)

^{74}Se Levels (continued)

E(level)[†‡]	J^π[@]	$T_{1/2}$[#]	XREF	Comments
1838.65 *9*	(2+)		BC EFG LM	J^π: γ to 0^+.
1884.24[g] *8*	3+[b]	1.5 ps *6*	BCDEF L	
2107.96[h] *8*	4+[b]	1.9 ps *7*	CDEF LM	XREF: M(2101).
2146 *25*			M	
2231.45[f] *10*	6+[b]	0.86 ps *17*	CDEF L	
2314.05 *9*	(2+)		BC E	J^π: γ to 0^+.
2349.66[j] *10*	3−	23 ps *3*	CDEF IJKLM	XREF: M(2338). β_3=0.140 (from (^{16}O,^{14}C)). βR=0.77 *8* (from (p,p′)). B(E3)(Coul. ex.)=0.021 *5* (2002Ki06,evaluation). J^π: L(p,t)=(pol p,p′)=3.
2378.59 *11*	(1,2+)[&]		B	
2477.7 *6*	(2)		F	J^π: ΔJ=0 γ to 2^+.
2482 *25*	(2+)		M	J^π: L(p,t)=(2).
2563.43 *9*	(2+,3,4+)[a]		C E m	
2661.98[g] *12*	5+[b]	1.7 ps *6*	CDEF Lm	
2718 *10*	0+		M	J^π: L(p,t)=0.
2818.32 *19*	(2+,3,4+)[a]		C E	
2831.56[k] *12*	4−	10 ps *3*	CDEF	J^π: ΔJ=0, (E1) γ to 4^+; band assignment.
2842.63[j] *10*	5−[b]	7.3 ps *8*	DEF L	
2843.72 *24*	3−		J M	J^π: L(p,p′)=3; L(p,t)=(3).
2903 *2*	4+		J	J^π: L(p,p′)=4.
2918 *25*	(0+)		M	J^π: L(p,t)=(0).
2918.43 *14*	(2+,3,4+)[a]		C E	
2986.65[h] *13*	6+[c]		DEF	
3002 *4*			J	
3037.3 *4*	(2+)		C	J^π: γ to 0^+.
3078.01 *14*	(4)+		C E J	XREF: J(3080). J^π: γ′s to 2^+ and 4^+. L(p,p′)=4 in (p,p′) for a group at 3080 *4*.
3112.30 *23*	(2+,3,4+)		C E M	XREF: M(3114). J^π: γ′s to 2^+; log *ft*=7.64 from $4^{(+)}$.
3198.41[f] *14*	8+[b]	0.38 ps *4*	DEF L	
3200.17 *17*	(4)		C F	J^π: ΔJ=(0) γ to 4^+.
3250.11 *12*	(1,2+)[&]		BC	
3250.9 *4*	(2 to 5)		E m	L=4 in (p,t) corresponds to 3251 or 3253 level. J^π: γ to (3+); absence of γ′s to 0^+ and 2^+ disfavors J^π<4.
3253.3 *3*	(2 to 6)[e]		C E J m	J^π: if L(p,p′)=4 corresponds to this level, then J^π=(4+).
3306.0 *3*	(2 to 6)[e]		C	
3379.38 *25*	(2+)		C M	J^π: L(p,t)=(2).
3382.63[k] *14*	6−[b]	4.9 ps *17*	DEF	
3515.95[j] *15*	7−[b]	3.5 ps *3*	DEF	
3525.04[g] *21*	7+[b]	0.72 ps *24*	DEF	
3529 *4*	5−		J	J^π: L(p,p′)=5.
3538 *25*	(6+)		M	J^π: L(p,t)=(6).
3539.72 *11*	(1,2+)[&]		B	
3580.30 *25*	(2+)[a]		C J	J^π: L(p,p′)=(2).
3602 *4*	5−		J	J^π: L(p,p′)=5.
3624.46 *16*	(2+)		B M	XREF: M(2615). J^π: γ to 0^+; L(p,t)=(2).
3674.85 *21*	(2+,3,4+)[a]		C E	

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Adopted Levels, Gammas (continued)

^{74}Se Levels (continued)

E(level)[†‡]	J^{π}[@]	$T_{1/2}$[#]	XREF	Comments
3733.64 *16*	(1,2$^+$)[&]		B M	XREF: M(3719).
3749 *4*	(4$^+$)		J	J^{π}: L(p,p′)=4.
3771.91 *16*	(4$^+$)[a]		C J m	XREF: J(3780). J^{π}: L(p,p′)=4.
3781.7 *3*			F	
3788.27 *11*	(1,2$^+$)[&]		B m	
3841.69[i] *19*	7$^-$		EF M	XREF: M(3858). J^{π}: γ to 7$^-$; L(p,t)=(7); band assignment.
3845 *4*	3$^-$		J	J^{π}: L(p,p′)=3.
3928.62 *24*	(2 to 6)		C J	XREF: J(3920). J^{π}: log *ft*=7.16 from 4$^{(+)}$; γ to (4)$^+$.
3929.2[l] *4*	(8$^+$)[d]		F	
3930.56 *18*	(0$^+$,1)		BC	J^{π}: log *ft*=5.9 from (0$^-$); γ to 2$^+$.
3972.90 *17*	(2$^+$)		B m	J^{π}: γ to 0$^+$; if L(p,t)=(2) corresponds to this level.
3980 *4*	(6$^+$)		J	J^{π}: L(p,p′)=(6).
4005 *4*	2$^+$		J m	J^{π}: L(p,p′)=2.
4044.37 *25*	(1,2$^+$)[&]		B	
4089.9 *4*			F	
4094.44 *20*	(2$^+$)		B M	XREF: M(4109). J^{π}: γ to 0$^+$; L(p,t)=(2).
4118 *4*			J	
4198.21[k] *20*	8$^-$[b]	1.4 ps *3*	DEF	
4224 *4*			J	
4256.29[f] *17*	10$^+$[b]	0.21 ps *4*	DEF	
4266.7 *4*	(1,2$^+$)[&]		B	
4279 *4*	4$^+$		J	J^{π}: L(p,p′)=4.
4309.17 *18*	(3,4$^+$)		C m	XREF: I(4330). J^{π}: γ to 2$^+$; log *ft*=6.6 from 4$^{(+)}$.
4342.5 *4*	(2$^+$)		B J m	XREF: J(4337). J^{π}: γ to 0$^+$; L(p,p′)=(2).
4362 *4*			J	
4379.9 *3*	(1,2$^+$)[&]		B	
4403.20[j] *21*	9$^-$[b]	0.58 ps *6*	DEF	
4441.67 *21*	(3,4$^+$)		C E	J^{π}: γ to 2$^+$; log *ft*=6.1 from 4$^{(+)}$.
4449.64[g] *23*	9$^+$[b]	0.57 ps *9*	DEF	
4487.2 *3*	(1,2$^+$)[&]		B	
4496.29 *17*	(3,4$^+$)		C E	J^{π}: γ to 2$^+$; log *ft*=5.98 from 4$^{(+)}$.
4516.24 *18*	(3,4$^+$)		C	J^{π}: γ to 2$^+$; log *ft*=6.03 from 4$^{(+)}$.
4536.49 *24*	(1,2$^+$)[&]		B	
4544.5 *3*			F	
4579.94 *25*	(3,4,5)		C m	J^{π}: log *ft*=6.26 from 4$^{(+)}$.
4586.15 *20*	(3,4$^+$)		C m	J^{π}: γ to 2$^+$; log *ft*=5.99 from 4$^{(+)}$.
4592.08 *16*	(4$^+$)		C J m	XREF: J(4595). J^{π}: γ to 2$^+$; log *ft*=5.65 from 4$^{(+)}$; L(p,p′)=4.
4661.91 *19*	(3,4$^+$)		C M	XREF: M(4628). J^{π}: γ to 2$^+$; log *ft*=5.83 from 4$^{(+)}$.
4677 *4*	3$^-$		J	J^{π}: L(p,p′)=3.
4699.5 *3*	(3,4$^+$)		C	J^{π}: γ to 2$^+$; log *ft*=6.16 from 4$^{(+)}$.
4757.2 *4*	(3,4$^+$)		C J m	XREF: J(4758). J^{π}: γ to 2$^+$; log *ft*=6.43 from 4$^{(+)}$; if L(p,p′)=(3) corresponds to this level, then J^{π}=(3$^-$).

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Adopted Levels, Gammas (continued)

^{74}Se Levels (continued)

E(level)[†‡]	J^{π}[@]	$T_{1/2}$[#]	XREF	Comments
4794.45 *21*	(3,4,5)		C m	J^{π}: log *ft*=5.98 from $4^{(+)}$; if L(p,p′)=(3) corresponds to this level, then J^{π}=(3$^-$).
4848.7[i] *3*	(9$^-$)	0.40 ps +*13*−*11*	F	J^{π}: γ′s to 7$^-$ and 9$^-$; band assignment.
4877.49[l] *24*	(10$^+$)		F	J^{π}: γ′s to 8$^+$ and 10$^+$; band assignment.
5060.2 *4*			F	
5146 *4*	3$^-$		J	J^{π}: L(p,p′)=3.
5209.2[k] *4*	10$^-$[b]	0.9 ps *3*	DEF	
5426 *4*	3$^-$		J	J^{π}: L(p,p′)=3.
5443.1[f] *4*	12$^+$[b]	0.12 ps *3*	DEF	
5491.2[j] *4*	11$^-$[b]	0.23 ps *2*	DEF	
5492.9[g] *4*	11$^+$[b]		D F	
5928.5[i] *4*	(11$^-$)[d]	0.26 ps *7*	F	
6014.8[l] *4*	(12$^+$)		F	J^{π}: γ′s to 10$^+$ and 12$^+$; band assignment.
6253.6[k] *5*	12$^-$[b]	<0.74 ps	D F	
6685.9[g] *5*	(13$^+$)		D F	J^{π}: γ′s to 11$^+$ and 12$^+$; band assignment.
6686.9[j] *5*	13$^-$[b]	0.22 ps *10*	DEF	
6735.6[f] *5*	14$^+$[b]	0.135 ps *14*	DEF	
7063.7[i] *8*	(13$^-$)[d]	<0.76 ps	F	
7206.9[l] *8*	(14$^+$)[c]		F	
7451.6[k] *7*	14$^-$[c]		D F	
7844.8 *7*	15$^-$[c]		F	E(level): this level is also related to the 3$^-$ band, could Be due to band crossing.
7944.0[g] *6*	(15$^+$)[c]		F	
7978.7[j] *6*	15$^-$[c]		D F	
8116.7[f] *7*	16$^+$[b]	0.075 ps *15*	D F	
8537.3[l] *8*	(16$^+$)[c]		F	
8815.6[k] *8*	16$^-$[c]		F	
9294.4[g] *9*	(17$^+$)[d]		F	
9300.3[j] *7*	17$^-$[c]		F	
9680.5[f] *9*	18$^+$[b]	0.076 ps *21*	D F	
10128.8[l] *11*	(18$^+$)[c]		F	
10370.5[k] *11*	(18$^-$)[d]		F	
10826.4[g] *13*	(19$^+$)[d]		F	
10926.3[j] *12*	(19$^-$)[d]		F	
11360.2[f] *12*	20$^+$[c]		D F	
12104.5[k] *15*	(20$^-$)[d]		F	
13202.3[f] *15*	22$^+$[c]		F	

† Least squares fitted values from adopted γ-ray energies for levels populated in γ-ray studies. For levels populated in transfer reactions only, weighted average of available values taken.

‡ In (^{3}He,n), FWHM=500 keV, peaks are reported at 740 with L=(0), and at 2030(or 2330) and 3050 with L=(2), and at 3850.

From DSA and recoil-Doppler shift method in in-beam γ, unless stated otherwise.

@ Parity not given when only a range of spin values given.

& γ to 0$^+$. log *ft* value in ^{74}Br ε decay (25.4 min) will restrict J^{π} to 1 if J^{π} ^{74}Br g.s.=0$^-$.

a γ′s to 2$^+$ and 4$^+$.

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Adopted Levels, Gammas (continued)

^{74}Se Levels (continued)

[b] From $\gamma(\theta)$, $\gamma\gamma(\theta)$, $T_{1/2}$ and band assignment in in-beam γ-ray studies.
[c] From $\gamma(\theta)$, $\gamma\gamma(\theta)$ and band assignment in in-beam γ-ray studies.
[d] From band assignment in in-beam γ-ray studies.
[e] γ to 4^+. Absence of γ's to 0^+ and 2^+ disfavors J<4.
[f] Band(A): g.s. band.
[g] Band(B): 3^+ band.
[h] Band(C): 2^+ band.
[i] Band(D): 7^- band.
[j] Band(E): 3^- band.
[k] Band(F): 4^- band.
[l] Band(G): (8^+) band. Probably related to excitation of $g_{9/2}$ neutron (1998Do09).

$\gamma(^{74}Se)$

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ	α[@]	$I_{(\gamma+ce)}$	Comments
634.74	2^+	634.78 *10*	100	0.0	0^+	E2				B(E2)(W.u.)=42.0 *6*
853.83	0^+	219.06 *10*	100 *4*	634.74	2^+	E2		0.047		B(E2)(W.u.)=77 *7*
		853.8		0.0	0^+	E0			0.82 *9*	q^2_K(E0/E2)=0.203 *14*, X(E0/E2)=0.011 *5*, ρ^2(E0)=0.0231 *22* (2005Ki02, evaluation).
1269.01	2^+	634.26 *10*	100 *8*	634.74	2^+	E2+M1	−5.6 *16*			B(M1)(W.u.)=0.0004 *3*; B(E2)(W.u.)=48 *14* δ: from $\gamma\gamma(\theta)$ in ^{74}Br ε (46 min). Other: −2.6 *2* from $\gamma\gamma(\theta)$ in ^{74}As β^-.
		1269.02 *7*	52 *3*	0.0	0^+	E2				B(E2)(W.u.)=0.80 *23*
1363.17	4^+	728.37 *7*	100	634.74	2^+	E2				B(E2)(W.u.)=80 *4*
1657.47	(0^+)	1022.74 *9*	100	634.74	2^+					
1838.65	(2^+)	984.82 *10*	100 *5*	853.83	0^+					
		1203.93 *9*	22 *11*	634.74	2^+	[M1,E2]				δ=0.18 *9* or 1.5 *3* (1992Ba68).
1884.24	3^+	521.07 *12*	10 *3*	1363.17	4^+					
		615.18 *7*	100 *8*	1269.01	2^+	(M1+E2)	+0.3 *1*			B(M1)(W.u.)=(0.029 *13*); B(E2)(W.u.)=(10 *8*)
		1249.45 *15*	89 *12*	634.74	2^+	(M1+E2)				
2107.96	4^+	744.75 *8*	40 *4*	1363.17	4^+	(M1+E2)				B(M1)(W.u.)<0.0067; B(E2)(W.u.)<17 δ=−4.3 *3* or 2.4 *2* (1992Ba68). Mult.: ΔJ=0 transition.
		838.93 *12*	100 *8*	1269.01	2^+	E2				B(E2)(W.u.)=24 *9*
		1473.21 *12*	25 *3*	634.74	2^+	[E2]				B(E2)(W.u.)=0.35 *14*
2231.45	6^+	868.21 *9*	100	1363.17	4^+	E2				B(E2)(W.u.)=72 *15*
2314.05	(2^+)	1044.88 *13*	46 *5*	1269.01	2^+					
		1460.3 *2*	100 *8*	853.83	0^+					
		1679.4 *2*	92 *10*	634.74	2^+					
2349.66	3^-	511.0 *3*	≈14	1838.65	(2^+)					
		986.5 *2*	57 *11*	1363.17	4^+	(E1)				B(E1)(W.u.)=3.8×10^{-6} *10*
		1080.4 *2*	100 *14*	1269.01	2^+	(E1)				B(E1)(W.u.)=5.1×10^{-6} *11*
		1714.9[&] *2*	91 *9*	634.74	2^+	(E1)				B(E1)(W.u.)=1.15×10^{-6} *21*
2378.59	$(1,2^+)$	1109.6 *2*	50 *6*	1269.01	2^+					
		1524.6 *4*	28 *6*	853.83	0^+					
		1743.9 *2*	100 *28*	634.74	2^+					
		2378.3 *4*	28 *11*	0.0	0^+					
2477.7	(2)	1843.1 *6*	100	634.74	2^+	(D)				Mult.: ΔJ=0 transition.
2563.43	$(2^+,3,4^+)$	679.04 *12*	12 *2*	1884.24	3^+					
		724.9 *5*	12 *5*	1838.65	(2^+)					
		1200.37 *12*	100 *11*	1363.17	4^+					
		1294.4 *1*	39 *5*	1269.01	2^+					
		1928.8 *4*	12 *2*	634.74	2^+					
2661.98	5^+	777.68 *13*	100 *7*	1884.24	3^+	E2				B(E2)(W.u.)=43 *17*
		1299.04 *20*	47 *16*	1363.17	4^+					
2818.32	$(2^+,3,4^+)$	979.5 *2*	25 *5*	1838.65	(2^+)					

$\gamma(^{74}Se)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
2818.32	(2+,3,4+)	1455.5 *3*	100 *15*	1363.17	4+		
2831.56	4−	481.5 *3*	<15	2349.66	3−		
		1468.43 *13*	100 *13*	1363.17	4+	(E1)	B(E1)(W.u.)=1.1×10^{-5} *4* Mult.: ΔJ=0 transition.
2842.63	5−	493.01 *11*	93 *7*	2349.66	3−	E2	B(E2)(W.u.)=50 *7*
		611.4 *2*	48 *5*	2231.45	6+	(E1)	B(E1)(W.u.)=4.1×10^{-5} *7*
		734.56 *15*	100 *7*	2107.96	4+	(E1)	B(E1)(W.u.)=4.9×10^{-5} *7*
		1479.44 *15*	29 *3*	1363.17	4+	(E1)	B(E1)(W.u.)=1.7×10^{-6} *3*
2918.43	(2+,3,4+)	1080.1 *4*	19 *4*	1838.65	(2+)		
		1555.4 *3*	13 *2*	1363.17	4+		
		1649.4 *2*	14 *2*	1269.01	2+		
		2283.5 *2*	100 *15*	634.74	2+		
2986.65	6+	878.68 *10*	100 *13*	2107.96	4+		
		1623.5 *7*	95 *18*	1363.17	4+	Q	
3037.3	(2+)	2183.4 *3*	100	853.83	0+		
3078.01	(4)+	763.6 *2*	3.7 *8*	2314.05	(2+)		
		1194.0 *3*	1.5 *3*	1884.24	3+		
		1714.9[&] *2*	100 *10*	1363.17	4+		
		2443.7 *4*	6.0 *15*	634.74	2+		
3112.30	(2+,3,4+)	797.3 *5*	100	2314.05	(2+)		
		1843.1 *3*	<20	1269.01	2+		
		2478.4[&] *4*	<10	634.74	2+		
3198.41	8+	966.98 *10*	100	2231.45	6+	E2	B(E2)(W.u.)=95 *10*
3200.17	(4)	368.5 *2*	50 *10*	2831.56	4−		
		723[a] *1*	<50	2477.7	(2)		
		850.1 *3*	100 *50*	2349.66	3−		
		1837.6 *3*	50 *15*	1363.17	4+	(D)	Mult.: ΔJ=0 transition.
3250.11	(1,2+)	871.4 *5*	3.5 *17*	2378.59	(1,2+)		
		936.4 *2*	10 *2*	2314.05	(2+)		
		1981.0 *2*	18 *1*	1269.01	2+		
		2396.1 *2*	38 *2*	853.83	0+		
		2615.2 *2*	100 *3*	634.74	2+		
		3249.9 *5*	83 *4*	0.0	0+		
3250.9	(2 to 5)	1366.6 *4*	100	1884.24	3+		
3253.3	(2 to 6)	1890.1 *3*	100	1363.17	4+		
3306.0	(2 to 6)	1198.0 *5*	57 *14*	2107.96	4+		
		1421.7 *3*	100 *14*	1884.24	3+		
3379.38	(2+)	1494.5 *3*	100 *14*	1884.24	3+		
		2745.7 *4*	91 *23*	634.74	2+		
3382.63	6−	538.9 *2*	69 *6*	2842.63	5−	(M1)	B(M1)(W.u.)=0.0064 *24*
		551.12 *15*	100 *8*	2831.56	4−	E2	B(E2)(W.u.)=40 *15*

$^{74}_{34}Se_{40}$-7

γ(^{74}Se) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
3382.63	6^-	720.8 *2*	50 *10*	2661.98	5^+	(E1)	B(E1)(W.u.)=3.4×10^{-5} *14*
		1151.0 *2*	90 *13*	2231.45	6^+	(E1)	B(E1)(W.u.)=1.5×10^{-5} *6*
3515.95	7^-	529.2 *4*	<4	2986.65	6^+	[E1]	B(E1)(W.u.)=1.3×10^{-5} *13*
		673.38 *15*	100 *8*	2842.63	5^-	E2	B(E2)(W.u.)=58 *8*
		1284.5 *3*	8 *1*	2231.45	6^+	[E1]	B(E1)(W.u.)=3.8×10^{-6} *7*
3525.04	7^+	863.4 *3*	100 *12*	2661.98	5^+	(E2)	B(E2)(W.u.)=63 *24*
		1293.0 *3*	41 *14*	2231.45	6^+		
3539.72	$(1,2^+)$	1161.3 *3*	12 *4*	2378.59	$(1,2^+)$		
		1225.7 *1*	81 *8*	2314.05	(2^+)		
		1700.9 *3*	46 *8*	1838.65	(2^+)		
		1882.3 *2*	96 *12*	1657.47	(0^+)		
		2270.6 *6*	100 *19*	1269.01	2^+		
		2685.4 *6*	15 *8*	853.83	0^+		
		2904.5 *3*	100 *8*	634.74	2^+		
		3539.8 *7*	38 *8*	0.0	0^+		
3580.30	(2^+)	2217.1 *3*	100 *20*	1363.17	4^+		
		2945.5[&] *4*	<60	634.74	2^+		
3624.46	(2^+)	1310.1 *2*	9 *1*	2314.05	(2^+)		
		2356.0 *4*	14 *2*	1269.01	2^+		
		2770.8 *5*	37 *2*	853.83	0^+		
		2990.1 *30*	6 *2*	634.74	2^+		
		3624.6 *3*	100 *3*	0.0	0^+		
3674.85	$(2^+,3,4^+)$	1566.4 *3*	10 *2*	2107.96	4^+		
		2312.1 *6*	100 *14*	1363.17	4^+		
		3040.4[&] *3*	<32	634.74	2^+		
3733.64	$(1,2^+)$	2465.0 *3*	54 *7*	1269.01	2^+		
		2879.7 *2*	25 *7*	853.83	0^+		
		3098.2 *6*	25 *7*	634.74	2^+		
		3733.3 *4*	100 *7*	0.0	0^+		
3771.91	(4^+)	1933.8 *3*	50 *10*	1838.65	(2^+)		
		2408.7 *3*	100 *40*	1363.17	4^+		
		2502.3 *5*	19 *5*	1269.01	2^+		
		3137.1 *3*	70 *10*	634.74	2^+		
3781.7		399.2 *3*	100	3382.63	6^-		
3788.27	$(1,2^+)$	1409.7 *2*	16 *3*	2378.59	$(1,2^+)$		
		1474.5 *2*	27 *3*	2314.05	(2^+)		
		1949.6 *2*	37 *3*	1838.65	(2^+)		
		2130.6 *2*	71 *3*	1657.47	(0^+)		
		2518.3 *8*	14 *3*	1269.01	2^+		
		2934.2 *4*	19 *3*	853.83	0^+		
		3788.0 *3*	100 *5*	0.0	0^+		

$^{74}_{34}Se_{40}$-8

$\gamma(^{74}Se)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[‡]	E_f	J^{π}_f	Mult.[#]	Comments
3841.69	7^-	325.84 *15*	72 *7*	3515.95	7^-	(D)	Mult.: ΔJ=0 transition.
		1609.6 *4*	100 *19*	2231.45	6^+	D	
3928.62	(2 to 6)	850.6 *2*	100	3078.01	$(4)^+$		
3929.2	(8^+)	730.5 *8*	100 *67*	3198.41	8^+		
		942.7 *5*	37 *10*	2986.65	6^+		
		1698.4[a] *12*	≈33	2231.45	6^+		
3930.56	$(0^+,1)$	2661.6 *2*	100 *6*	1269.01	2^+		
		3295.5 *3*	53 *3*	634.74	2^+		
3972.90	(2^+)	2088.7 *15*	<14	1884.24	3^+		
		2704.0 *3*	67 *6*	1269.01	2^+		
		3119.0 *12*	39 *6*	853.83	0^+		
		3338.6 *18*	19 *6*	634.74	2^+		
		3972.7 *2*	100 *6*	0.0	0^+		
4044.37	$(1,2^+)$	2387.4 *5*	47 *13*	1657.47	(0^+)		
		3190.2 *4*	100 *13*	853.83	0^+		
		3410.0 *10*	40 *13*	634.74	2^+		
		4044.1 *4*	87 *13*	0.0	0^+		
4089.9		573.9 *3*	100	3515.95	7^-		
4094.44	(2^+)	1715.7 *2*	100 *14*	2378.59	$(1,2^+)$		
		2437.5 *4*	52 *10*	1657.47	(0^+)		
		3241.0 *15*	48 *10*	853.83	0^+		
		3460.0 *12*	90 *10*	634.74	2^+		
		4093.9 *7*	38 *10*	0.0	0^+		
4198.21	8^-	682.1 *3*	14 *3*	3515.95	7^-	D	
		815.6 *2*	100 *8*	3382.63	6^-	E2	B(E2)(W.u.)=53 *13*
4256.29	10^+	1057.89 *10*	100	3198.41	8^+	E2	B(E2)(W.u.)=110 *21*
4266.7	$(1,2^+)$	3631.9 *5*	100 *8*	634.74	2^+		
		4266.5 *5*	43 *8*	0.0	0^+		
4309.17	$(3,4^+)$	1746.1 *4*	28 *10*	2563.43	$(2^+,3,4^+)$		
		1994.8 *3*	100 *20*	2314.05	(2^+)		
		2945.5[&] *4*	<60	1363.17	4^+		
		3040.4[&] *3*	<240	1269.01	2^+		
4342.5	(2^+)	3488.6 *8*	29 *10*	853.83	0^+		
		4342.4 *4*	100 *14*	0.0	0^+		
4379.9	$(1,2^+)$	2541.5 *5*	8 *3*	1838.65	(2^+)		
		3110.2 *18*	8 *3*	1269.01	2^+		
		3526.1 *8*	15 *3*	853.83	0^+		
		3745.1 *6*	15 *3*	634.74	2^+		
		4379.6 *4*	100 *6*	0.0	0^+		
4403.20	9^-	887.23 *15*	100	3515.95	7^-	E2	B(E2)(W.u.)=96 *10*
4441.67	$(3,4^+)$	2333.2 *3*	75 *8*	2107.96	4^+		

$^{74}_{34}Se_{40}$-9

$\gamma(^{74}Se)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	Comments
4441.67	(3,4$^+$)	3173.1 *3*	100 *17*	1269.01	2$^+$		
		3806.7 *5*	100 *17*	634.74	2$^+$		
4449.64	9$^+$	924.53 *15*	100 *6*	3525.04	7$^+$	E2	B(E2)(W.u.)=61 *12*
		1251.4 *4*	31 *9*	3198.41	8$^+$	D	
4487.2	(1,2$^+$)	3852.4 *3*	100 *10*	634.74	2$^+$		
		4486.9 *10*	15 *10*	0.0	0$^+$		
4496.29	(3,4$^+$)	2388.1 *2*	81 *13*	2107.96	4$^+$		
		3227.5& *3*	<56	1269.01	2$^+$		
		3861.8 *5*	100 *19*	634.74	2$^+$		
4516.24	(3,4$^+$)	1853.8 *3*	45 *9*	2661.98	5$^+$		
		1952.8 *3*	32 *6*	2563.43	(2$^+$,3,4$^+$)		
		3153.3 *3*	100 *18*	1363.17	4$^+$		
		3247.5 *10*	<45	1269.01	2$^+$		
		3881.6 *5*	83 *9*	634.74	2$^+$		
4536.49	(1,2$^+$)	2158.0 *4*	23 *9*	2378.59	(1,2$^+$)		
		3267.5 *8*	36 *9*	1269.01	2$^+$		
		3901.5 *3*	100 *9*	634.74	2$^+$		
		4538.0 *20*	9 *5*	0.0	0$^+$		
4544.5		346.2 *2*	100 *17*	4198.21	8$^-$		
		762.9 *4*	83 *25*	3781.7			
4579.94	(3,4,5)	2472.2 *4*	100 *13*	2107.96	4$^+$		
		2695.5 *3*	100 *13*	1884.24	3$^+$		
4586.15	(3,4$^+$)	1508.0 *3*	18 *4*	3078.01	(4)$^+$		
		2478.4& *4*	<38	2107.96	4$^+$		
		2701.8 *3*	100 *15*	1884.24	3$^+$		
		3951.5 *7*	92 *15*	634.74	2$^+$		
4592.08	(4$^+$)	2028.2 *3*	<12	2563.43	(2$^+$,3,4$^+$)		
		2485.6 *4*	10 *3*	2107.96	4$^+$		E_γ: level-energy difference=2484.1.
		2708.5 *3*	15 *3*	1884.24	3$^+$		
		3227.5& *3*	<22	1363.17	4$^+$		E_γ: poor fit. Level-energy difference=3228.8.
		3323.2 *4*	15 *3*	1269.01	2$^+$		
		3957.6 *6*	100 *12*	634.74	2$^+$		
4661.91	(3,4$^+$)	2098.7 *3*	33 *7*	2563.43	(2$^+$,3,4$^+$)		
		2825.1 *10*		1838.65	(2$^+$)		
		3297.7 *3*	100 *20*	1363.17	4$^+$		E_γ: level-energy difference=3298.7.
		3393.8& *4*	<40	1269.01	2$^+$		
		4027.1 *7*	80 *13*	634.74	2$^+$		
4699.5	(3,4$^+$)	3336.3 *3*	100 *15*	1363.17	4$^+$		
		4064.4 *11*	16 *5*	634.74	2$^+$		
4757.2	(3,4$^+$)	3393.8& *4*	<100	1363.17	4$^+$		

Adopted Levels, Gammas (continued)

$\gamma(^{74}Se)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[‡]	E_f	J^{π}_f	Mult.[#]	Comments
4757.2	(3,4$^+$)	4123.5 *12*	120 *8*	634.74	2$^+$		
4794.45	(3,4,5)	1022.7 *2*	31 *4*	3771.91	(4$^+$)		
		3430.8 *3*	100 *14*	1363.17	4$^+$		
4848.7	(9$^-$)	445.5 *3*	17 *4*	4403.20	9$^-$	[M1,E2]	B(M1)(W.u.)<0.09; B(E2)(W.u.)<665
		1007.1 *3*	100 *15*	3841.69	7$^-$	[E2]	B(E2)(W.u.)=63 *+22−25*
4877.49	(10$^+$)	621.2 *2*	100 *13*	4256.29	10$^+$	(D)	Mult.: ΔJ=0 transition.
		948.4 *5*	75 *9*	3929.2	(8$^+$)		
		1679[a] *1*	≈31	3198.41	8$^+$		
5060.2		657.0 *3*	100	4403.20	9$^-$		
5209.2	10$^-$	1011.0 *3*	100	4198.21	8$^-$	(E2)	B(E2)(W.u.)=32 *11*
5443.1	12$^+$	1186.7 *4*	100	4256.29	10$^+$	E2	B(E2)(W.u.)=1.1×10^2 *3*
5491.2	11$^-$	1088.0 *3*	100	4403.20	9$^-$	E2	B(E2)(W.u.)=87 *8*
5492.9	11$^+$	1042.8 *5*	100 *14*	4449.64	9$^+$	Q	
		1236.9 *5*	24 *6*	4256.29	10$^+$	D	
5928.5	(11$^-$)	1079.7 *3*	100	4848.7	(9$^-$)	[E2]	B(E2)(W.u.)=80 *22*
6014.8	(12$^+$)	571.7 *3*	100 *14*	5443.1	12$^+$		
		1137.5 *6*	95 *48*	4877.49	(10$^+$)		
		1759 *2*	≈48	4256.29	10$^+$		
6253.6	12$^-$	1044.4 *3*	100	5209.2	10$^-$	E2	B(E2)(W.u.)>33
6685.9	(13$^+$)	1192.9 *6*	100 *17*	5492.9	11$^+$	Q	
		1243.1 *6*	23 *7*	5443.1	12$^+$		
6686.9	13$^-$	1195.7 *3*	100	5491.2	11$^-$	E2	B(E2)(W.u.)=6.E+1 *3*
6735.6	14$^+$	1292.4 *4*	100	5443.1	12$^+$	E2	B(E2)(W.u.)=63 *7*
7063.7	(13$^-$)	1135.2 *6*	100	5928.5	(11$^-$)	[E2]	B(E2)(W.u.)>21
7206.9	(14$^+$)	1193.0 *12*	100 *33*	6014.8	(12$^+$)		
		1763.3 *10*	53 *13*	5443.1	12$^+$	(Q)	
7451.6	14$^-$	1198.0 *4*	100	6253.6	12$^-$	Q	
7844.8	15$^-$	1157.8 *5*	100	6686.9	13$^-$	(Q)	
7944.0	(15$^+$)	1208.2 *6*	47 *10*	6735.6	14$^+$	D	
		1258.2 *5*	100 *8*	6685.9	(13$^+$)	Q	
7978.7	15$^-$	1291.8 *4*	100	6686.9	13$^-$	(Q)	
8116.7	16$^+$	1381.1 *4*	100	6735.6	14$^+$	E2	B(E2)(W.u.)=81 *17*
8537.3	(16$^+$)	1330.5 *6*	100 *19*	7206.9	(14$^+$)		
		1801.6 *8*	19 *7*	6735.6	14$^+$	(Q)	
8815.6	16$^-$	1364.0 *5*	100	7451.6	14$^-$	(Q)	
9294.4	(17$^+$)	1350.4 *6*	100	7944.0	(15$^+$)		
9300.3	17$^-$	1321.6 *4*	100 *16*	7978.7	15$^-$		
		1455.4 *4*	100 *16*	7844.8	15$^-$	(Q)	
9680.5	18$^+$	1563.8 *6*	100	8116.7	16$^+$	E2	B(E2)(W.u.)=43 *12*
10128.8	(18$^+$)	1591.5 *7*	100	8537.3	(16$^+$)	Q	
10370.5	(18$^-$)	1554.8 *7*	100	8815.6	16$^-$		

$^{74}_{34}Se_{40}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{74}Se)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]
10826.4	(19^+)	1532 *1*	100	9294.4	(17^+)	
10926.3	(19^-)	1626 *1*	100	9300.3	17^-	
11360.2	20^+	1679.7 *7*	100	9680.5	18^+	Q
12104.5	(20^-)	1734 *1*	100	10370.5	(18^-)	
13202.3	22^+	1842 *1*	100	11360.2	20^+	(Q)

† Weighted average taken, whenever possible.

‡ Photon branching ratios. Weighted average from various studies.

\# From measured $T_{1/2}$ of levels and RUL of Weisskopf estimates for transitions of E2 or M2 multipolarity.

@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

& Multiply placed.

a Placement of transition in the level scheme is uncertain.

$^{74}_{34}Se_{40}$-12

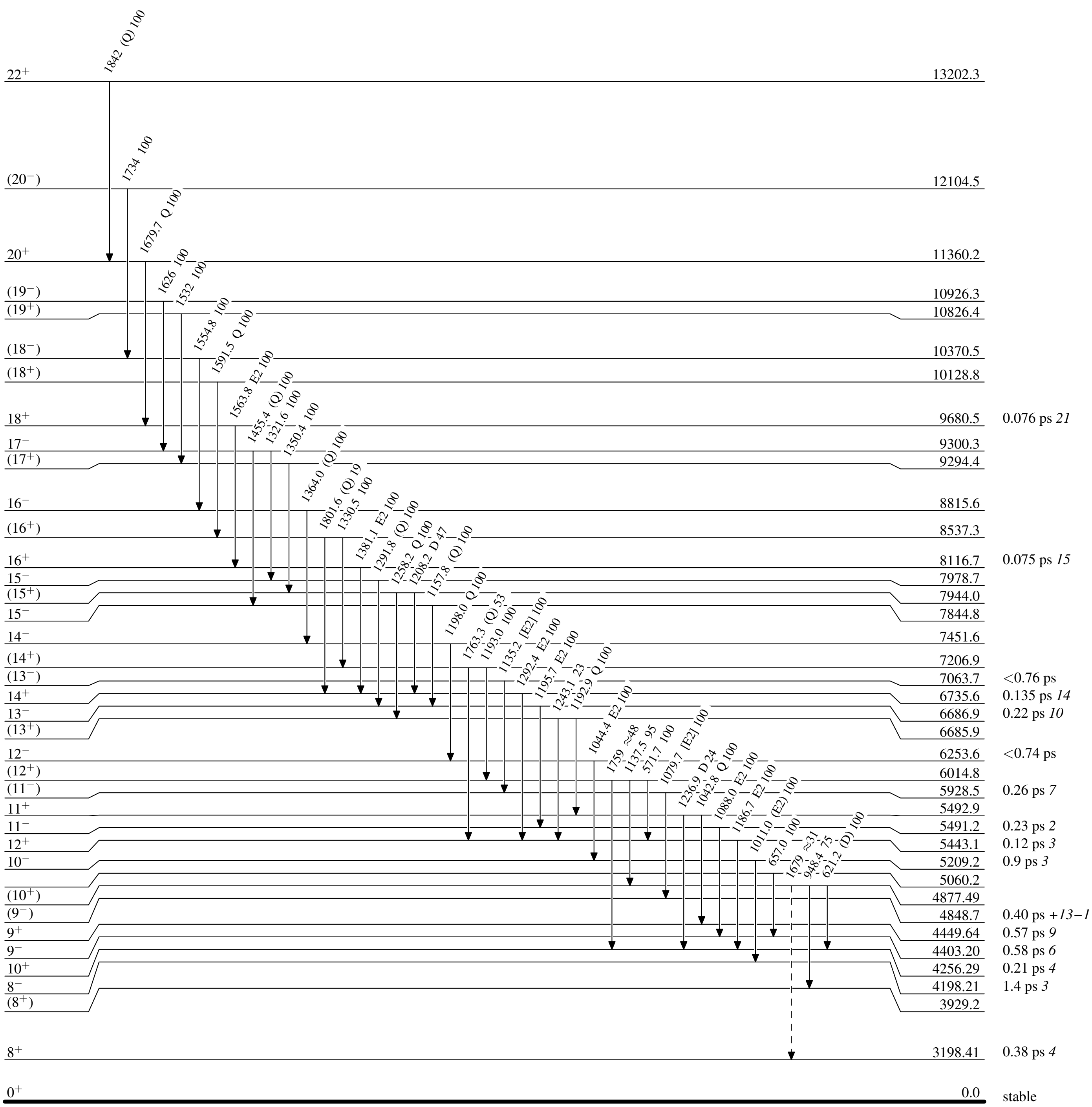
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

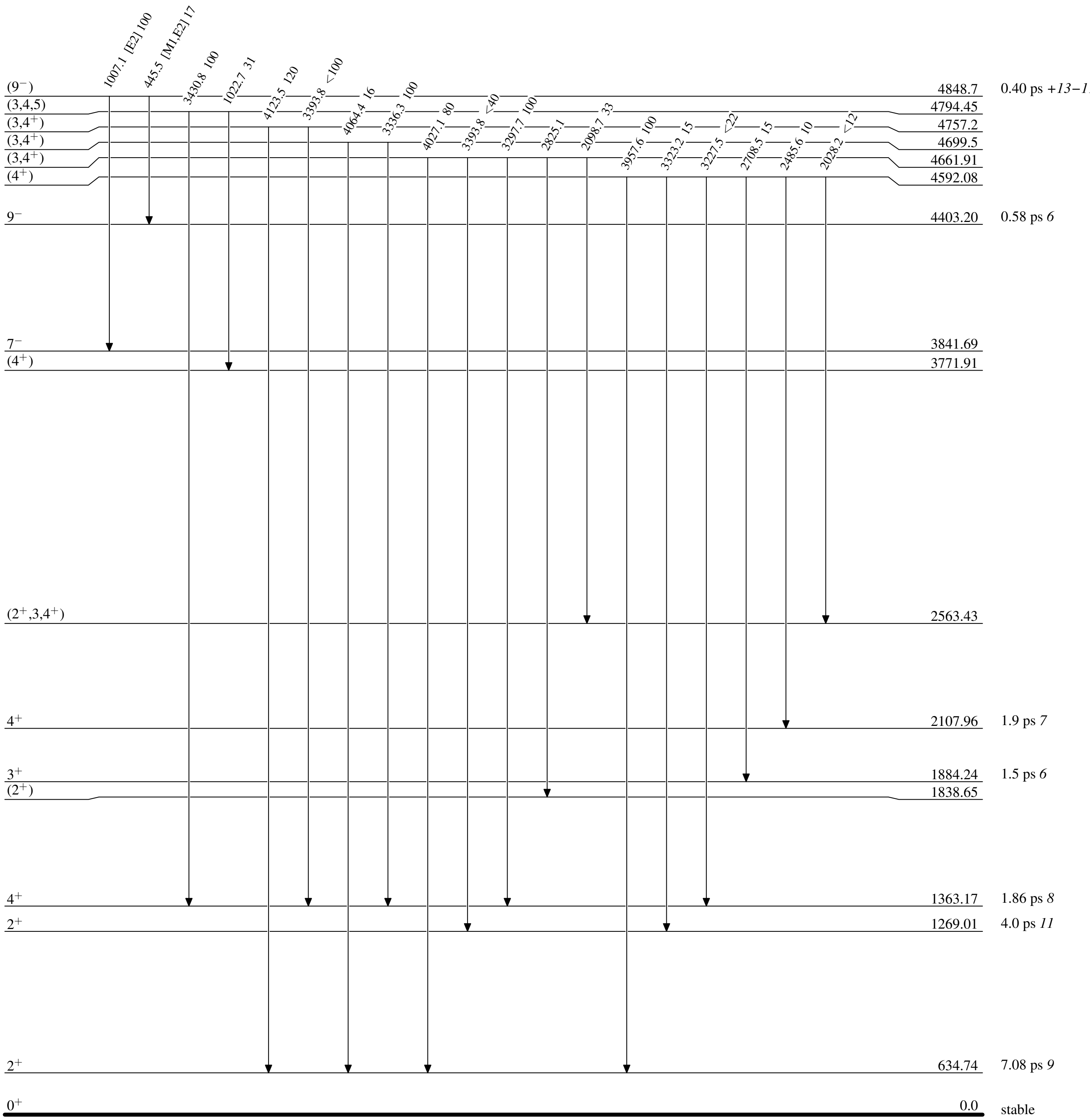


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

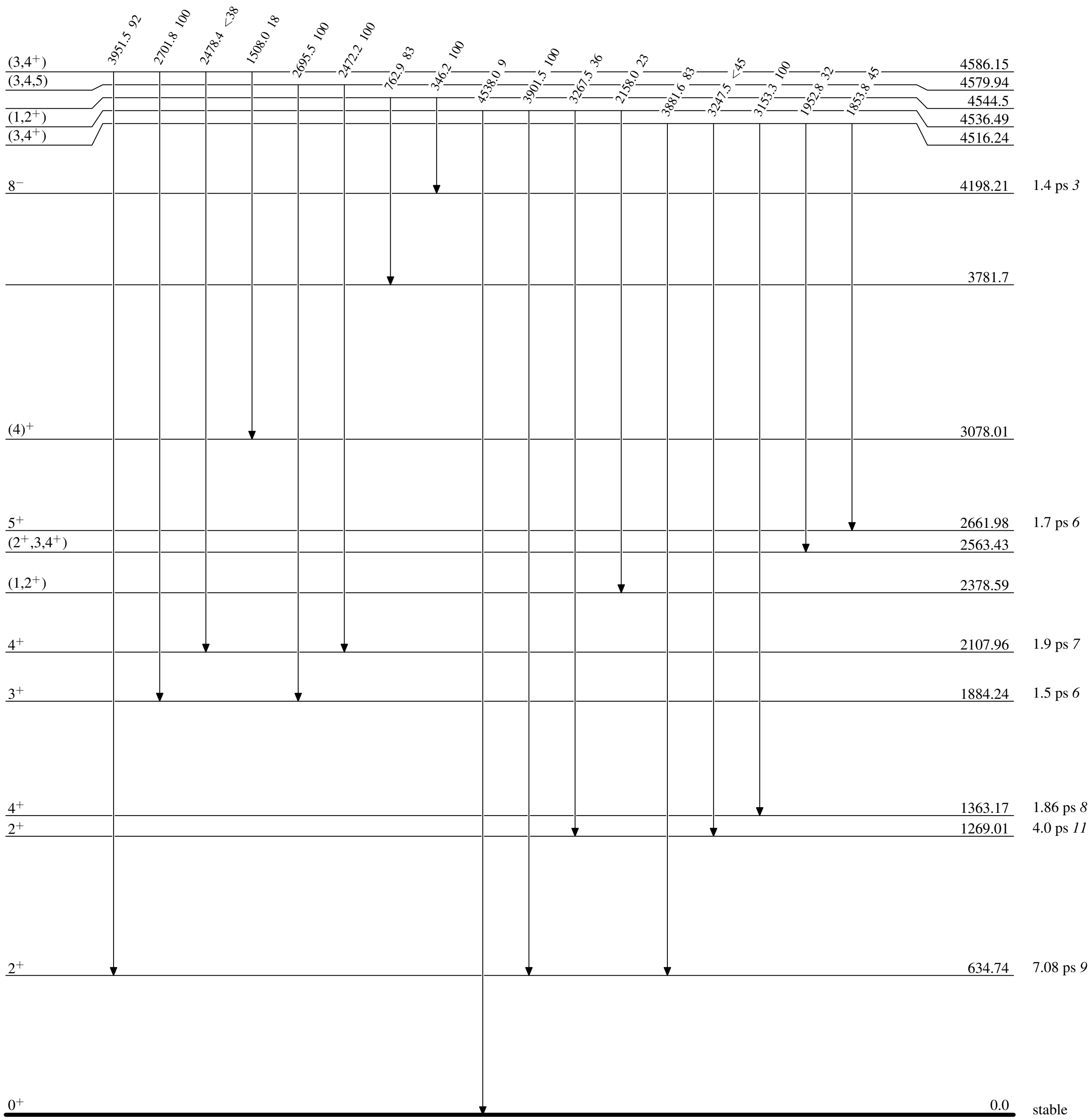


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

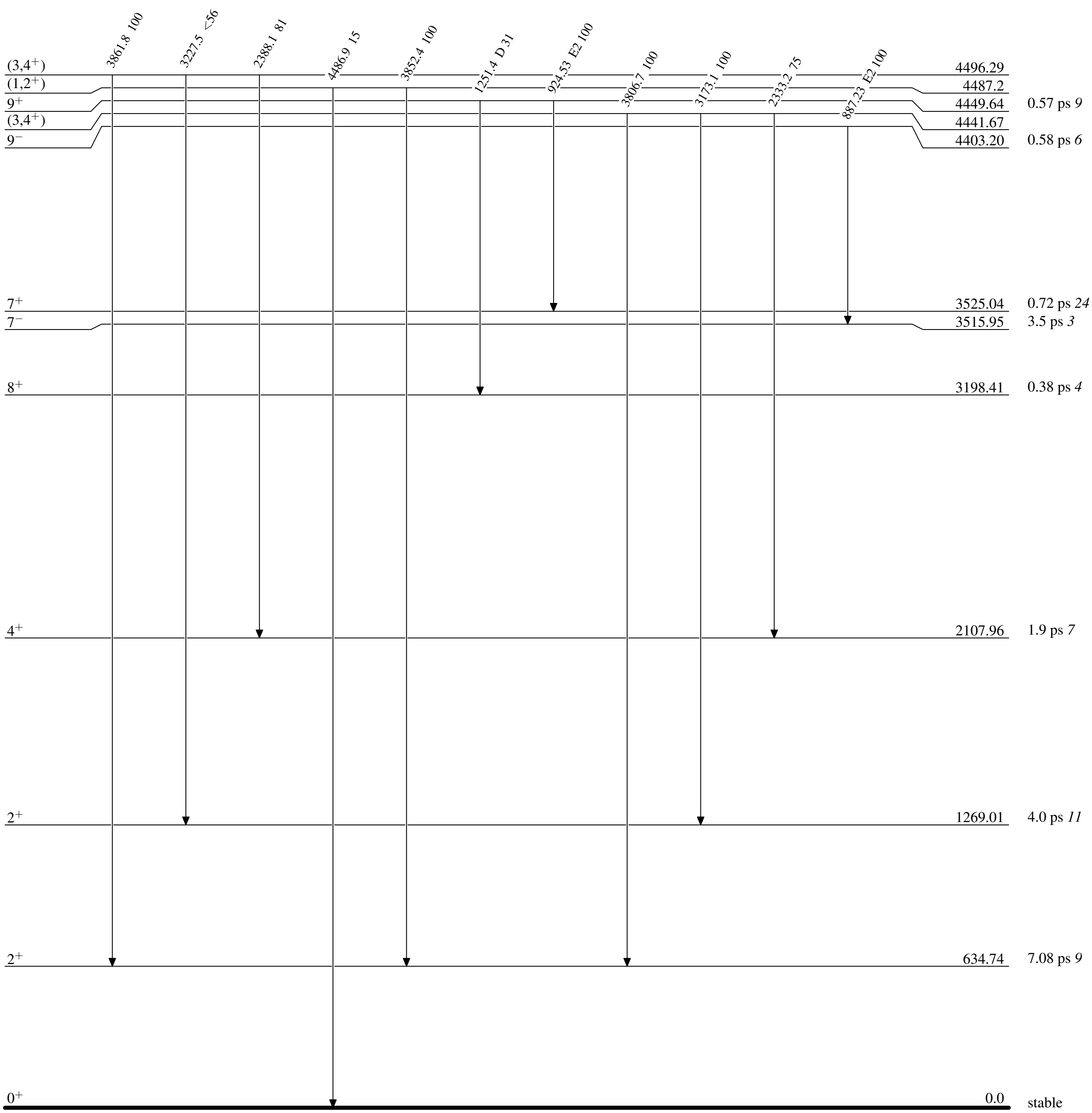


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

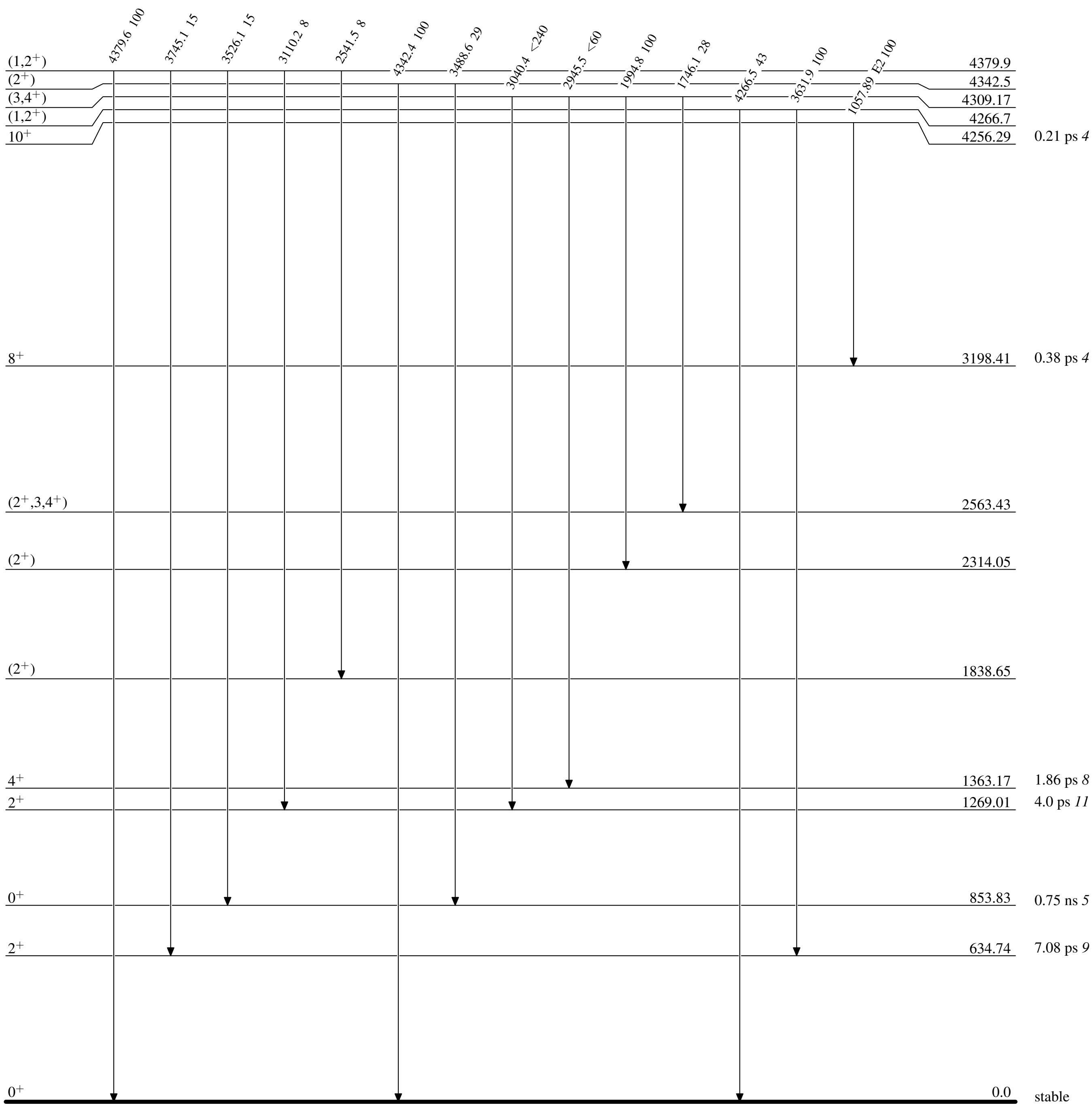


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

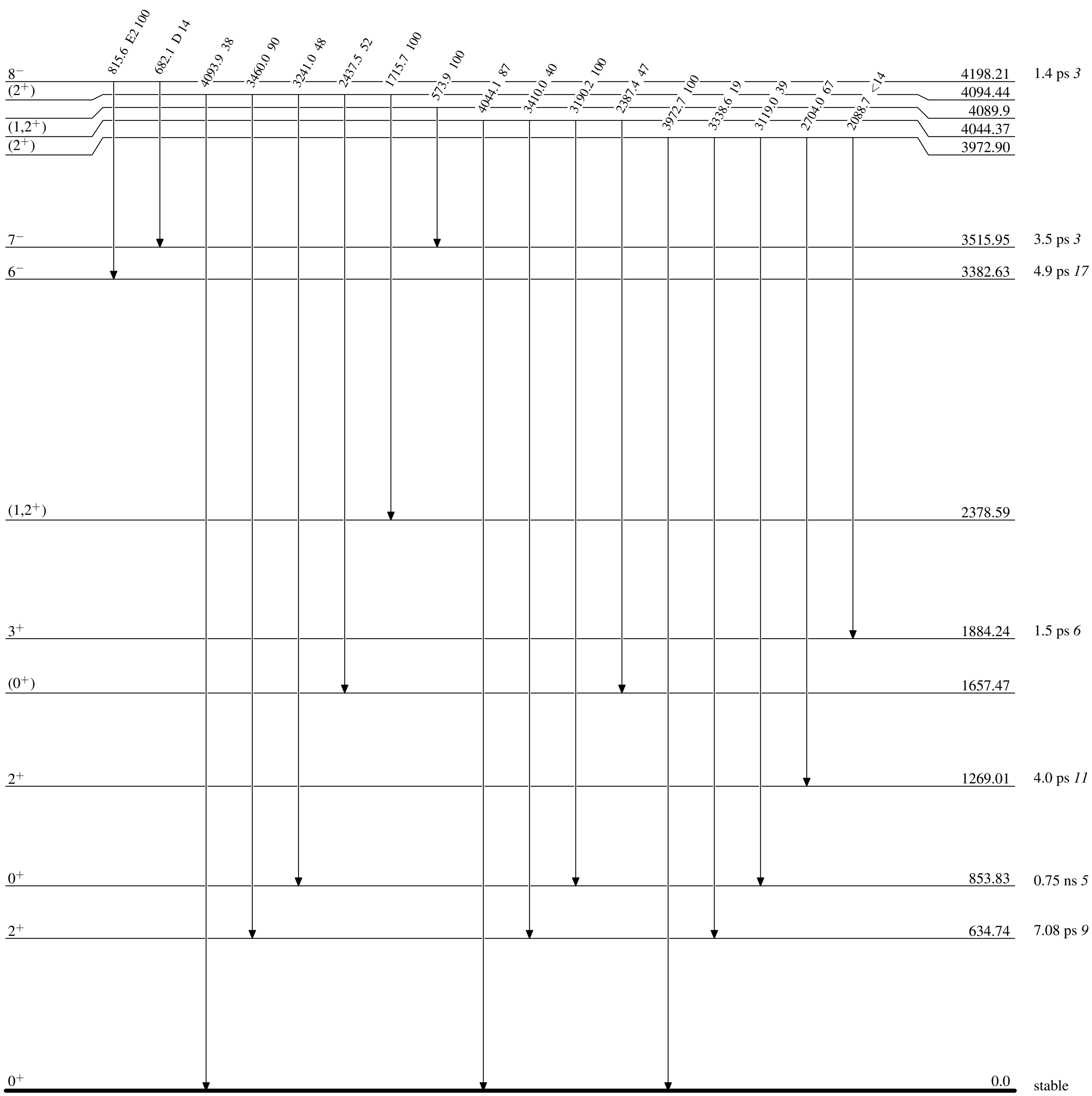


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

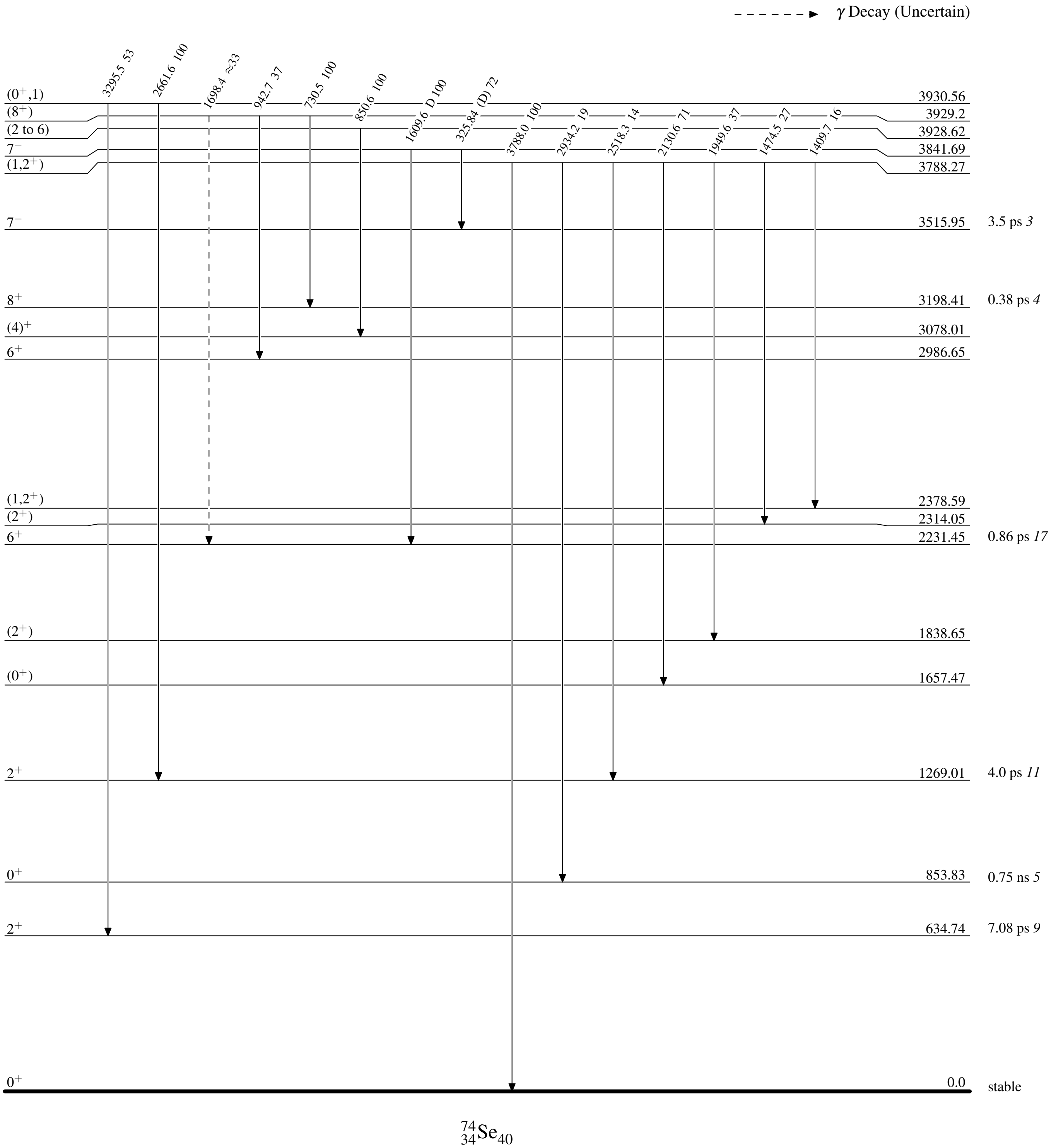


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

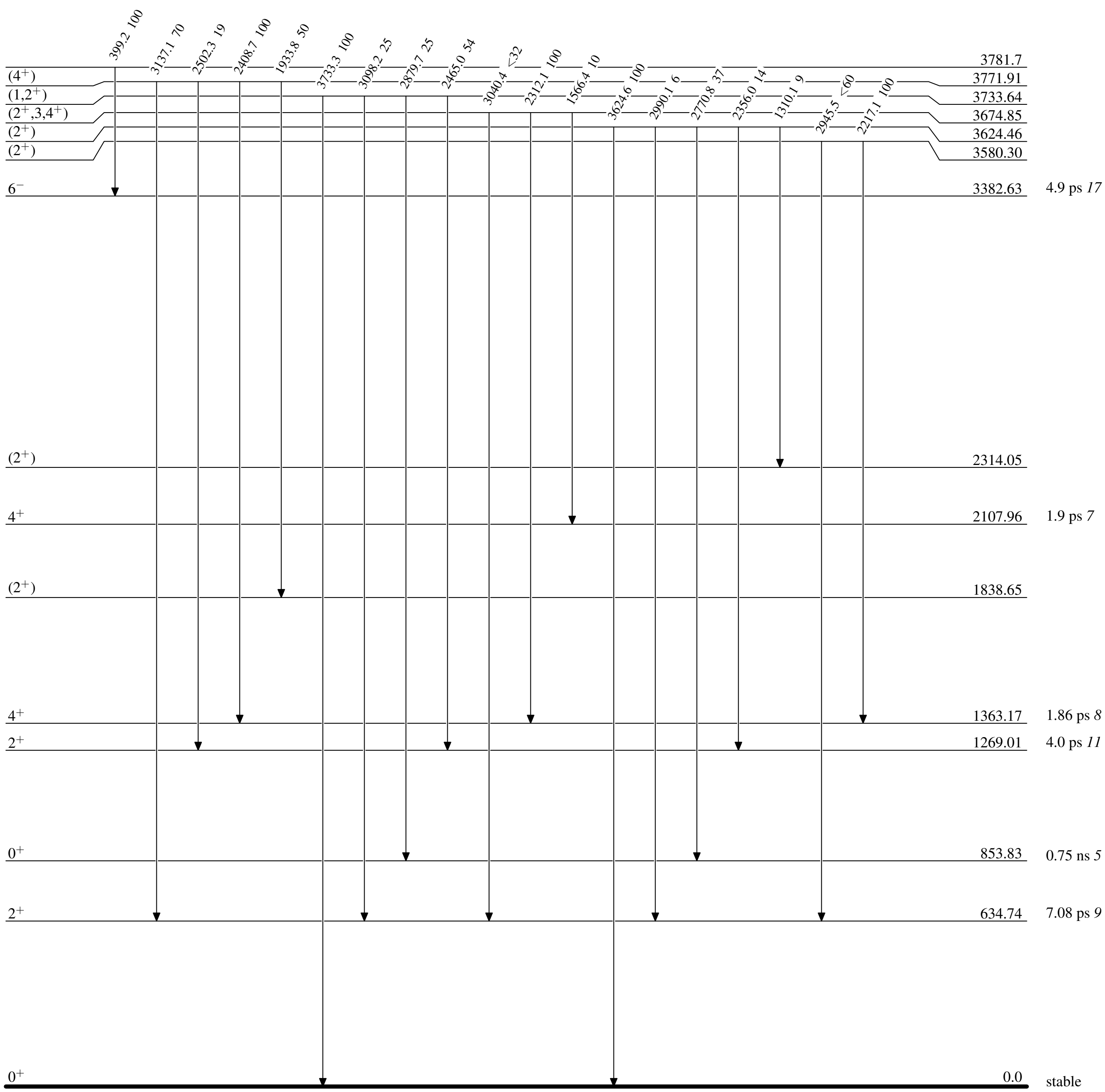
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

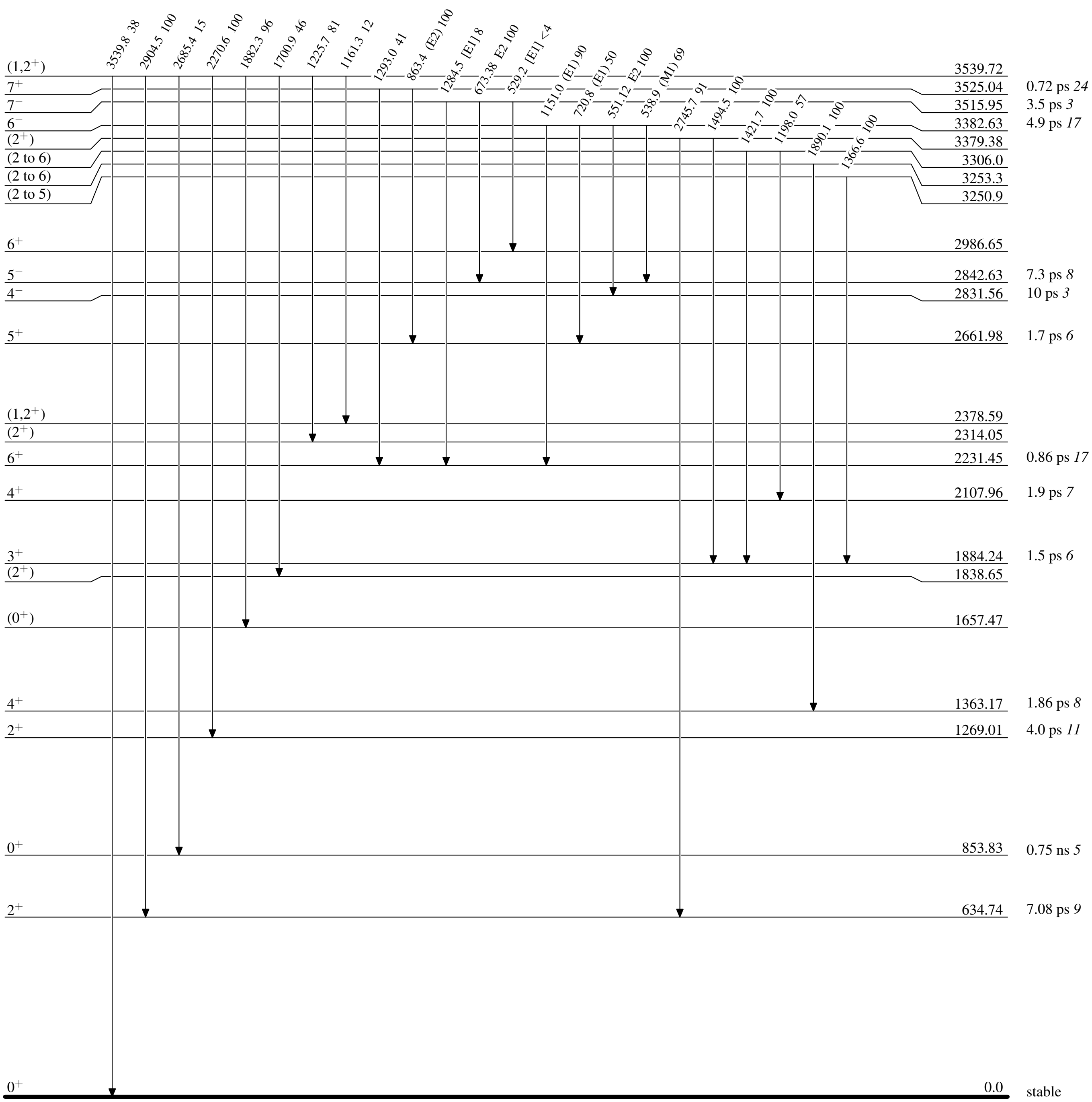


$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{74}_{34}Se_{40}$

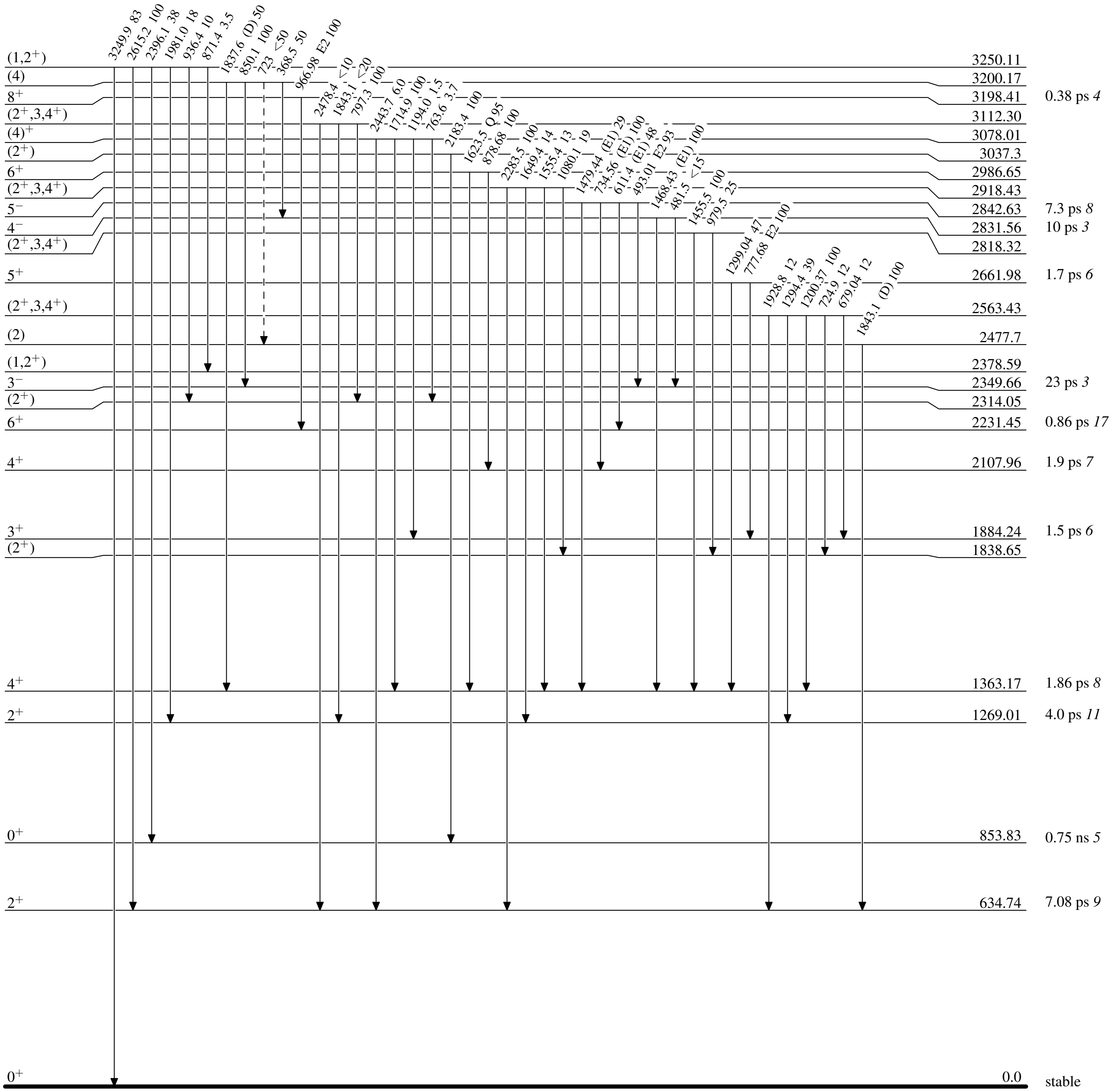
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

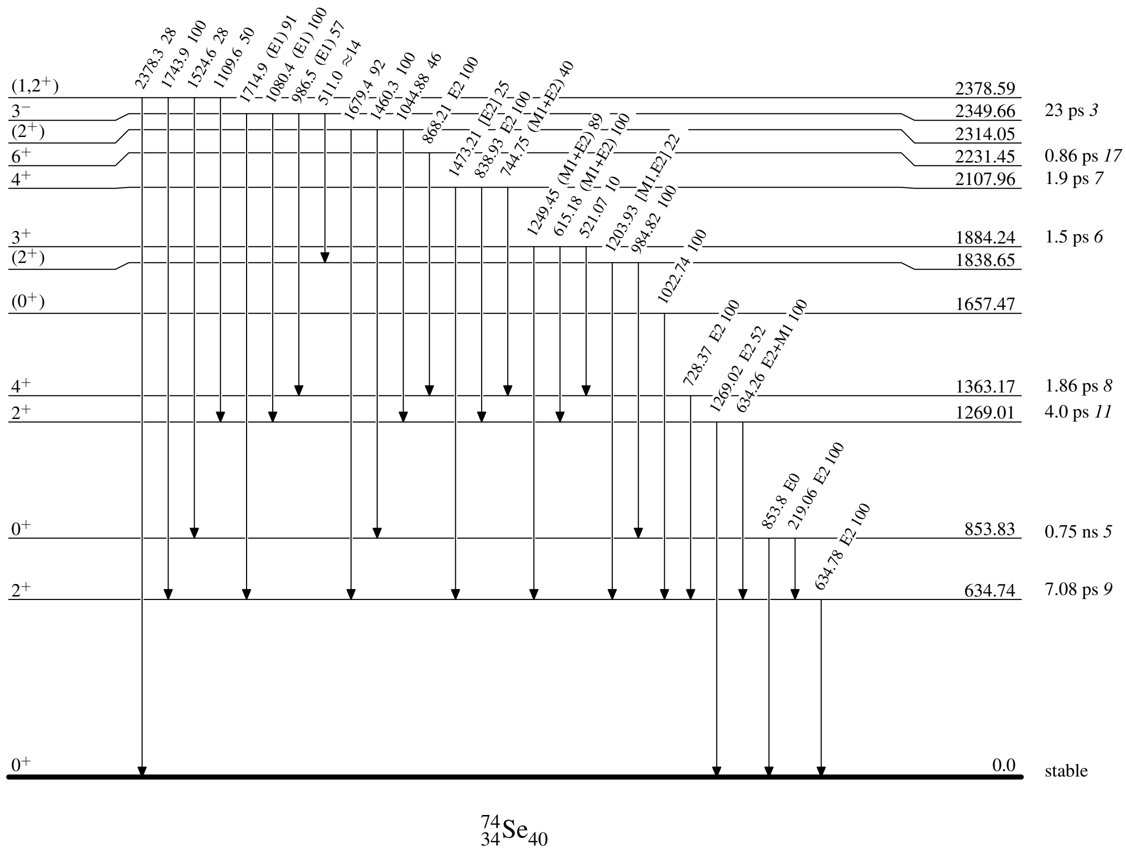


$^{74}_{34}Se_{40}$

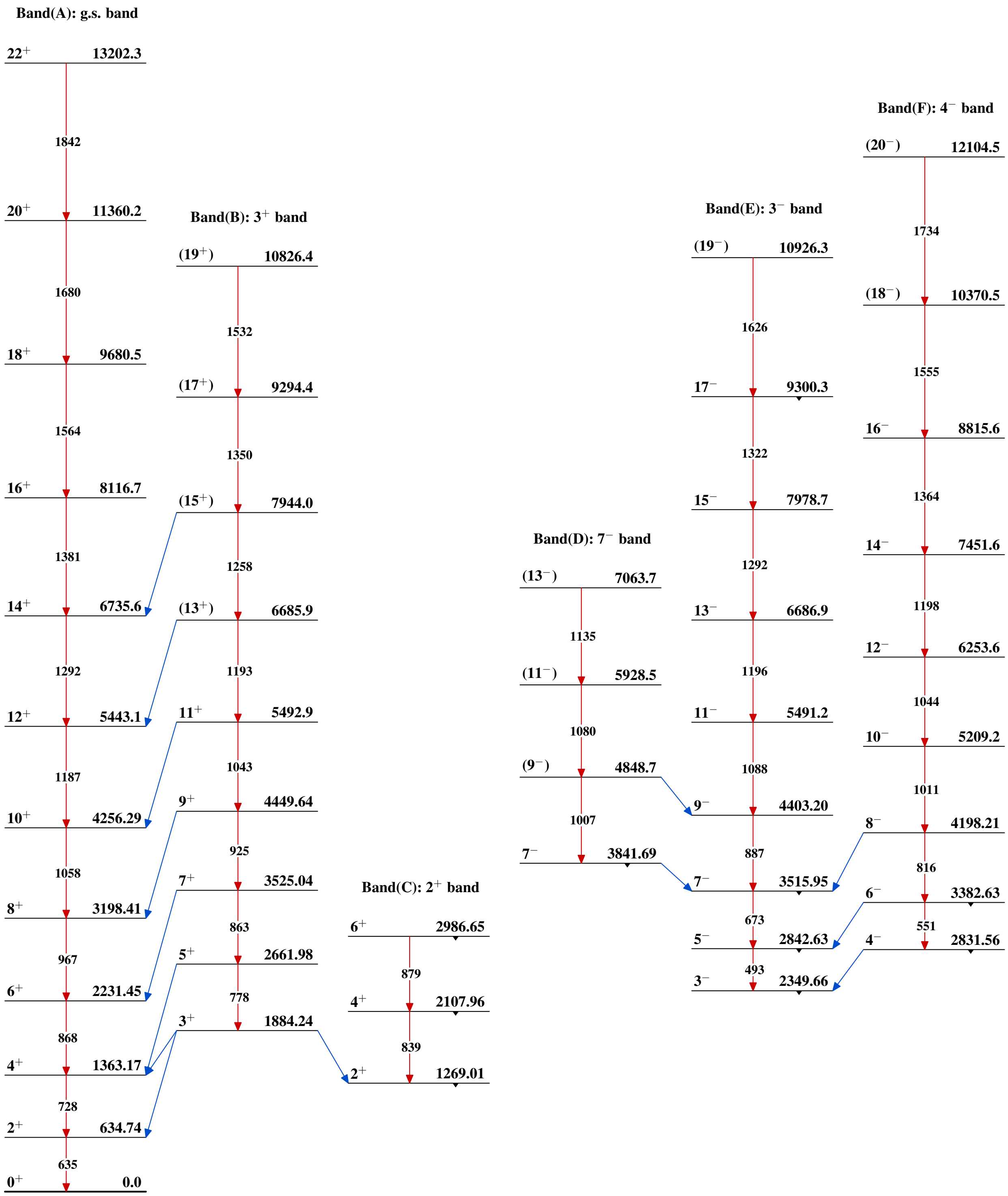
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

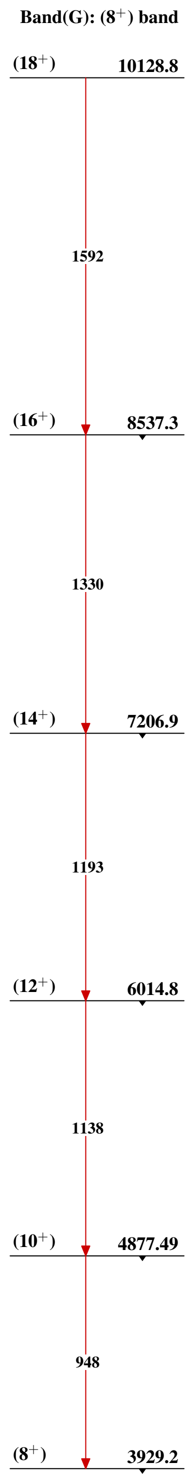


Adopted Levels, Gammas



$^{74}_{34}Se_{40}$

Adopted Levels, Gammas (continued)



$^{74}_{34}Se_{40}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Q(β^-)=−4963 *9*; S(n)=11153.79 *7*; S(p)=9506.7 *9*; Q(α)=−5090.96 *8* 2021Wa16
S(2n)=19181.38 *2*, S(2p)=16407.45 *2* (2021Wa16).
Other reactions:
^{72}Ge(^{6}Li,d),E=34 MeV: 1984Co08, analyzed spectroscopic factors.
^{76}Se(e,e),E=225 MeV: 1988Kh02 (also 1987Ku21,1987Kh07). Measured σ and comparison with theory.
^{76}Se(d,^{3}He),E=25 MeV: 1983Ro08, deduced g.s. proton occupation numbers.
Giant dipole resonances studied by 1976Ca06 using (γ,xn) reactions.
(^{12}C,X),(^{16}O,X),(^{18}O,X),E=40-52 MeV: 1985GuZZ, GDR decay characteristics.
(γ,xn): GDR study: 1975Go16.
GDR experimental study in (^{12}C,X) reaction.
Additional information 1.
For neutron resonances see 1971Fe01, 1969Ma15, 1964Co31.
^{76}Ge(π^+,π^-): 1991Ka20, 1991Ci10.
Mass measurements: 2010Mo03, 2008Ra09, 2006Sc38, 2002Bf02, 2001Fr25, 2001Do08, 1993Hy02, 1991Hy01, 1985El01 (also 1984El01).

^{76}Se Levels

In ^{74}Ge(^{3}He,n), a level is seen at 4.1 MeV *1* which may correspond to any of the 12 or so levels between 4.0 and 4.2 MeV.

Cross Reference (XREF) Flags

A	^{76}As β^- decay (26.254 h)	I	^{75}As(^{3}He,d)	Q	^{76}Se(p,p′γ),(α,α′γ)
B	^{76}Br ε+β^+ decay (16.14 h)	J	^{75}Se(n,γ) E=thermal	R	^{76}Se(d,d′),(pol d,d′)
C	^{76}Br ε decay (1.31 s):?	K	^{75}As(p,n) IAR	S	^{76}Se(α,α′)
D	^{76}Ge 2β^- decay (1.926×10^{21} y)	L	^{76}Se(γ,γ′)	T	Coulomb excitation
E	^{70}Zn(^{12}C,α2nγ)	M	^{76}Se(pol γ,γ′)	U	^{76}Br(n,p) E=thermal
F	^{74}Ge(^{3}He,n)	N	^{76}Se(n,n′)	V	^{77}Se(d,t)
G	^{74}Ge(α,2nγ)	O	^{76}Se(n,n′γ)	W	^{78}Se(p,t)
H	^{74}Ge(^{16}O,^{14}C)	P	^{76}Se(p,p′),(pol p,p′)		

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[‡]	XREF	Comments
0.0[b]	0$^+$	stable	ABCDEfGHIJ LMNOPQRSTUVW	RMS charge radius (<r^2>)$^{1/2}$=4.1395 fm *16* (2013An02 evaluation). J$^{\pi}$: microwave absorption method (1950Ge05,1949St07,1933Ra02) consistent with J=0. Valence protons in g.s. from transfer reaction measurements (2009Ka06). From (p,t) reactions, 2007Fr10 deduce very similar neutron pair correlations for ^{76}Se and ^{76}Ge. From (^{3}He,n) reaction, 2013Ro10 deduce no evidence of pairing vibrations for ^{76}Se and ^{76}Ge, and conclude a simple BCS structure for the ground states of both nuclei.
559.103[b] *5*	2$^+$	11.98 ps *+16−40*	ABC EfGHIJ LMNOPQRSTUVW	μ=+0.70 *11* (2019Mc05,2020StZV) Q=−0.35 *4* (2019He07,2021StZZ) β_2=0.28 *1* (1993Mo05) J$^{\pi}$: E2 γ to 0$^+$. T$_{1/2}$: from averaged B(E2)↑=0.432 *+15−6* (2016Pr01

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
				evaluation), based on the following measurements: mean lifetime τ=15.5 ps *+13−19* (1963Pr04 in (γ,γ')), 13 ps *2* (1960De08 in (γ,γ')), 33 ps *22* (1955Co55,$\gamma\gamma$(t)). Coulomb excitation measurements: B(E2)↑=0.419 *43* (1995Ka29, incident energy above the Coulomb barrier), 0.425 *9* (1984Zo01, RDM and DSA), 0.423 *6* (1977Le11), 0.42 *2* (1974Ba80, superseded by 1977Le11), 0.390 *40* (1970AgZV), 0.45 *4* (1962Ga13), 0.480 *43* (1962St02), 0.42 *8* (1960An07), 0.43 *6* (1956Te26). μ: transient-field method in Coul. ex. (2019Mc05), with measured g^{76}Se/g^{74}Se=0.96 *7* for first 2^+ states. Others: +0.806 *46* (1998Sp03,transient-field method in Coul. ex.); +0.81 *22* (1967Mu10, $\gamma\gamma(\theta$,H) in ^{76}As β^-), +0.80 *22* (1969He11, IMPAC in Coul. Ex.). Q: reorientaton in Coul. ex. (2019He07). Others: −0.34 *7* (1977Le11, reorientation in Coul. ex.); −0.30 *5* (1976VoZY). β_2(p,p′): 0.28 *1* (1993Mo05); 0.310 *10*, 0.301 *15* (1984De01); 0.27 *4*, 0.28 *4* (1983Ma59); 0.278 *7*, 0.293 *7* (1979Ma28); 0.323 (1970He10). β_2(n,n′): 0.28 (1976La12). β_2R=1.52 *5* (1984Ku09), 1.72 *5* (1981Br23). $\beta_2(\alpha,\alpha')$: 0.265, 0.356 (1988Ba35). β_2(Coul. ex.): 0.268 (1977Le11), 0.309 (1974Ba80), 0.319 (1970AgZV). $\beta_2(^{16}O,^{14}O)$: 0.326 (1976Co09).
1122.279 *8*	0^+	12.1 ps *+39−24*	AB IJ L OPQR T VW	$T_{1/2}$: from B(E2) in Coul. ex. Otehr: 11 ps *5* from B(E2) ratios of unresolved 563γ and 559γ (1964By02) in Coul. ex. J^{π}: E0 transition to 0^+. Also $\gamma\gamma(\theta)$ in ^{76}As β^- and ^{76}Br ε decay.
1216.154[c] *6*	2^+	3.3 ps *3*	AB E G IJ LM OPQRSTUVW	μ=0.61 *11* (1998Sp03,2020StZV) Q=+0.19 *4* (2019He07,2021StZZ) β_2=0.28 *1* (1993Mo05) μ: transient-field method in Coul. ex. (1998Sp03), measured value of 0.70 *12* in 1998Sp03 is re-evaluated to 0.61 *11* in 2020StZV. Q: reorientaton in Coul. ex. (2019He07). J^{π}: E2 γ to 0^+. $T_{1/2}$: from B(E2) in Coul. ex. Other: 3.5 ps *14* (DSAM in (α,2nγ)). β_2(p,p′)=0.085 *2* (1993Mo05). $\beta_2(\alpha,\alpha')$=0.1 (1988Ba35).
1330.872[b] *8*	4^+	1.52 ps *3*	ABC E G IJ OPQR T VW	μ=2.2 *4* (1998Sp03,2020StZV) Q=−0.29 *4* (2019He07,2021StZZ) μ: transient-field method in Coul. ex. (1998Sp03), measured value of 2.56 *36* in 1998Sp03 is re-evaluated to 2.2 *4* in 2020StZV. Q: reorientaton in Coul. ex. (2019He07). J^{π}: ΔJ=2, E2 γ to 2^+. Observed anisotropy forbids J=0. $T_{1/2}$: from B(E2) in Coul. ex. Others: 0.7 ps *+5−4* (DSAM in (α,2nγ)), 1.3 ps *+5−1* (p,p′γ). β_4(p,p′)=0.049 *10* or 0.012 (1986MoZR), 0.040 (1984De01), 0.014 *5*, 0.012 *4* (1983Ma59); β_4(n,n′)=0 (1984Ku09).

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
1688.971[d] *7*	3^+	3.2 ps *+12−6*	AB E G J OPQ T V	J^{π}: ΔJ=1 E2+M1 γ to 2^+; γ to 4^+.
1787.655 *7*	2^+	1.29 ps *+42−24*	AB IJ OPQRSTUV	J^{π}: M1+E2 γ to 2^+; γ rays to 0^+ and 4^+ and L(p,p′)=2. $T_{1/2}$: weighted average of 1.18 ps *+42−24* from DSAM in (n,n′γ) (2019Mu04) and 1.5 ps *+5−4* from B(E2) for 1229γ in Coul. ex. $\beta_2(\alpha,\alpha')$=0.07 (1988Ba35).
1791.437 *21*	0^+		AB O Q	J^{π}: from isotropic $\gamma(\theta)$ for 575.3γ and comparison of excitation function data with statistical model calculations using CINDY code in (n,n′γ); spin=0 also from $\gamma\gamma(\theta)$ in ^{76}Br ε decay (2018MoZZ).
2026.020[c] *8*	4^+	1.6 ps *2*	AB E G IJ OPQR T VW	J^{π}: ΔJ=2, E2 γ to 2^+ and M1+E2 γ to 4^+. $T_{1/2}$: weighted average of 1.8 ps *4* from DSAM in (α,2nγ) and 1.6 ps *2* from B(E2) in Coul. ex.
2127.224 *7*	$(2)^+$		AB IJ OPQR V	J^{π}: L=1+3 in (^{3}He,d) from $3/2^-$ and γ rays to 0^+ and 4^+.
2170.572 *11*	(0^+)	1.5 ps *+10−5*	AB IJ OPQR W	XREF: P(2177)R(2210). J^{π}: L(p,t)=(0). But L(^{3}He,d)=(1+3) from $3/2^-$ suggests (1^+,2^+,3^+). E(level): there may be two separate levels near this energy as indicated by contradictory L(p,t) and L(^{3}He,d).
2262.42[b] *16*	6^+	0.58 ps *5*	E G OPQR T	XREF: R(2290). J^{π}: ΔJ=2, E2 γ to 4^+; member of rotaional band. $T_{1/2}$: weighted average of 0.62 ps *7* from DSAM in (α,2nγ) and 0.56 ps *5* from B(E2) in Coul.ex.
2362.963 *13*			J W	XREF: W(2347). J^{π}: γ to 2^+; possible γ to 4^+.
2429.131[e] *8*	3^-	8.9 ps *+15−12*	AB GHIJ NOPQRST W	β_3=0.17 *1* (1993Mo05) B(E3)=0.032 *7* (2002Ki06 evaluation, from Coulomb ex.). J^{π}: L(d,^{3}He)=4 from $3/2^-$ and L(p,p′)=3. Also dipole γ rays to 2^+ and 3^+; 403γ to 4^+ can only be D,E2 from RUL. $T_{1/2}$: weighted average of 14 ps *7* from DSAM in (α,2nγ) and 8.7 ps *+15−12* from B(E3) in Coul. ex. and adopted γ branching ratios. β_3(p,p′)=0.17 *1* (1993Mo05), 0.15 (1984De01), 0.164 (1979Ma28, 1979Ma41); $\beta_3(\alpha,\alpha')$=0.183 (1988Ba35); β_3(Coul. ex.)=0.185 (1974Ba80); β_3(^{16}O,^{14}O)=0.185 (1976Co09); β_3R(n,n′)=0.77 *5* (1984Ku09).
2485.02 *5*	4^+	485 fs *+76−62*	OpQ	XREF: p(2487). J^{π}: spin=4 from $\gamma(\theta)$ in (n,n′γ); γ M1+E2 to 3^+.
2489.35[d] *5*	5^+	0.9 ps *+3−2*	E G OpQ	XREF: p(2487). J^{π}: ΔJ=2, E2 γ to 3^+; E2+M1 γ to 4^+.
2514.681 *11*	2^+	1.18 ps *+39−24*	AB IJ OPQR W	XREF: R(2540). J^{π}: M1+E2 γ to 2^+; 825.8γ D+Q to 3^+; 723.2γ to 0^+. L(p,t)=(2) also supports (2^+).
2558.73 *8*			B V	XREF: V(2570).
2604.09 *4*	1^+,2^+	1.08 ps *+64−30*	B O	J^{π}: M1+E2 γ to 2^+; γ to 0^+.
2617.89 *6*	$(4)^+$	402 fs *+76−55*	I OP VW	J^{π}: L(p,p′)=4 and L(^{3}He,d)=3 from $3/2^-$; M1+E2 γ to 4^+ and 3^+.
2655.383 *13*	1	0.82 ps *+22−15*	AB J OPQ w	J^{π}: dipole γ to 0^+.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
2669.904 *14*	2^-	0.89 ps *+27−17*	AB IJ O QR w	J^{π}: L(^{3}He,d)=2+4 from $3/2^-$; dipole γ to 2^+; γ to 0^+.
2691 *2*	(3^-)		P	J^{π}: L(p,p′)=(3).
2805.10 *15*	(4^+)	0.39 ps *+10−7*	OP	J^{π}: L(p,p′)=4.
2812.130 *34*	(3^+)		B J O Q w	XREF: B(?)w(2820). J^{π}: (M1+E2) γ rays to 2^+ and 3^+; (3^+) from (n,n′γ) based on γ decay pattern.
2817.24 *4*	(2^+)	98 fs *6*	B J O w	XREF: w(2820). J^{π}: γs to 4^+ and 0^+.
2824.797[e] *10*	5^-	6.2 ps *+21−14*	G iJ O	XREF: i(2830). J^{π}: ΔJ=2, E2 γ to 3^- and E1 γ to 4^+. Also L(^{3}He,d)=4 from $3/2^-$.
2829.61 *19*	(1,2)		B i	XREF: i(2830). J^{π}: 2830γ to 0^+.
2853 *2*	(4^+)		P r v	XREF: r(2870). J^{π}: L(p,p′)=4.
2859.781[f] *24*	4^-	1.2 ps *5*	B G IJ O v	J^{π}: ΔJ=1, M1+E2 γ to 3^- and ΔJ=0 or 2, D+Q γ to 4^+.
2869.34 *5*	$(1^+,2^+)$	82 ps *6*	B J O Qr v	XREF: r(2870). J^{π}: (M1+E2) γ to 2^+; γ to 0^+.
2910.993 *18*	(1 to 4)[a]		J w	
2917.32 *8*	$(4)^+$		IJ OP w	XREF: P(2915). J^{π}: L(p,p′)=4 and L(^{3}He,d)=3 from $3/2^-$. But 5^+ from (n,n′γ).
2950.171 *32*	1^+	92 fs *14*	B J L O Q	J^{π}: (M1) intense 2950γ to 0^+; M1+E2 γ to 2^+; dipole γ to 0^+ from $\gamma(\theta)$ in (γ,γ′). $T_{1/2}$: weighted average of 76 fs *13* from (γ,γ′) and 104 fs *11* from (n,n′γ).
2969.48 *6*	$2^-,3^-,4^-$		IJ OP r	XREF: I(2956). J^{π}: L(^{3}He,d)=4+2 from $3/2^-$.
2975.00 *5*	$(2^+,3,4^+)$		B O	J^{π}: γs to 2^+ and 4^+.
2975.98[c] *29*	6^+	1.2 ps *+7−4*	E G r T	J^{π}: ΔJ=2, E2 γ to 4^+; γ to 6^+. $T_{1/2}$: other: 1.1 ps *4* from B(E2) in Coul. ex.
3007.75 *8*	$(2)^+$	27.0 fs *21*	IJ OP VW	XREF: I(3022)P(3001). J^{π}: L(p,p′)=2 and L(^{3}He,d)=1+3 from $3/2^-$; M1+E2 γ to 2^+; γ to 0^+.
3031.57 *7*	0^+	98 fs *8*	O	J^{π}: from isotropic $\gamma(\theta)$ for 1815 and 2472 γ rays and comparison of excitation function data with statistical model calculations using CINDY code in (n,n′γ).
3042 *4*	(6^+)		P	J^{π}: L(p,p′)=6.
3045.79 *8*	(5^-)	0.39 ps *+28−12*	G O	J^{π}: (M1), ΔJ=(0) γ to 5^-. $T_{1/2}$: from DSAM in (n,n′γ). Other: <0.28 ns from (α,2nγ). Note that the quoted $T_{1/2}$ results in a large reduduced transition strength for any of Mult=E1, M1, or E2.
3069.62 *4*	2^+	457 fs *+83−62*	B J O Q	J^{π}: M1+E2 γ to 2^+; 1380.5γ dipole to 3^+; ε feeding (log *ft*=5.95) from 1^-.
3084.58 *6*	$(1^+,2^+,3^+)$[&]	32.6 fs *21*	I OP	
3105.48 *5*	(3^-)	202 fs *21*	B J OP W	J^{π}: L(p,p′)=3.
3160.115 *32*	(2^+)	0.38 ps *+21−10*	B J O Qr	J^{π}: γs to 4^+ and 1^+; ε feeding (log *ft*=6.4 from 1^-). But 0^+ proposed in (n,n′γ) from isotropic 2601$\gamma(\theta)$.
3161.80 *5*	(3^-)	272 fs *+63−43*	OP r	J^{π}: (M1+E2) γ to (3^-); γ to 4^+ and 2^+.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
3191.67 *8*	$(3)^{+}$[&]	112 fs *8*	B IJ O	XREF: I(3198). J^{π}: (M1+E2) γs to 2^{+} and 4^{+}.
3212.98 *10*	$1^{+},2^{+}$	11.1 fs *14*	i L O	XREF: i(3212). J^{π}: γ to 0^{+} can only be D,E2 from RUL; M1+E2 γ to 2^{+}. $T_{1/2}$: from DSAM in (n,n$'\gamma$). Other: 11 fs *4* from (γ,γ').
3216 *4*	$(3^{-}\&4^{+})$		P W	XREF: W(3232). J^{π}: L(p,p$'$)=3+4; also L(p,t)=(3,4) for a possible doublet.
3219.428 *33*	$(2^{+},3^{+})$	56.1 fs *42*	B iJ O	XREF: i(3212). J^{π}: γs to 2^{+} and 4^{+}; L(^{3}He,d)=1+3 for a group at 3212.
3225.7 *5*	$(6,8^{+})$		G	J^{π}: ΔJ=0 or 2 γ to 6^{+}. $T_{1/2}$: from DSAM in (α,2nγ) 1981KiZW give 1.1 ps *3* but this value is not reported in authors$'$ published work (1984Zo01).
3230.27 *8*	$1,2^{+}$	0.7 ps *+21−3*	O	J^{π}: γ to 0^{+} can only be D,E2 from RUL.
3238.78 *8*			G O	J^{π}: γ to 5^{-}.
3259.81 *8*			B p	XREF: p(3259).
3262.34[f] *25*	6^{-}	12 ps *6*	G p	XREF: p(3259). J^{π}: ΔJ=2, (E2) γ to 4^{-}, M1+E2 γ to 5^{-} and D+Q γ to 6^{+}.
3262.96 *8*		201 fs *+97−55*	IJ Op	XREF: p(3259). J^{π}: γ to 2^{+}.
3267.57 *6*	$(2^{+},3,4^{+})$	395 fs *+97−69*	B ij O	XREF: i(3268). J^{π}: γs to 2^{+} and 4^{+}.
3268.70 *4*	$(1^{-},2)$		B ij	XREF: i(3268). J^{π}: ε feeding (log *ft*=7.2) from 1^{-}; γ to (3^{-}).
3269.75[b] *33*	8^{+}	0.35 ps *7*	E G T	J^{π}: ΔJ=2, E2 γ to 6^{+}; member of rotational band. $T_{1/2}$: other: 0.34 ps *8* from B(E2) in Coul. Ex.
3282.19 *11*	$1,2^{+}$	101 fs *9*	O	J^{π}: γ to 0^{+} can only be D,E2 from RUL.
3294.8 *4*	(4^{+})		J P r w	XREF: P(3289). J^{π}: L(p,p$'$)=4.
3295.02 *12*	$(1^{+},2^{+})$		B i o r w	J^{π}: γ to 0^{+}; L(^{3}He,d)=1+3 for a group at 3295. E(level),$T_{1/2}$: 69 fs *5* for a 3295.28 level in (n,n$'\gamma$) could correspond to 3295.70+3297.05 levels in ^{76}Br ε decay based on matching of their decaying γ transitions.
3296.2 *6*	$(1^{+},2^{+})$		B i o r w	XREF: i(3295). E(level),$T_{1/2}$: see comment at 3295.7 level. J^{π}: γ to 0^{+}; L(^{3}He,d)=1+3 for a group at 3295.
3312.04 *30*	(6^{-})	0.14 ns *+14−7*	G w	J^{π}: ΔJ=1, D+Q (δ=0.25) γ to 5^{-}.
3331.51 *8*		229 fs *+42−35*	O	J^{π}: γ to 2^{+}.
3346.25 *11*			Op	XREF: p(3342). J^{π}: γs to 4^{+}.
3348.48 *11*	$(1^{+},2^{+})$	0.3 ps *+15−2*	i Op	XREF: i(3345)p(3342). J^{π}: γ to 0^{+}; L(^{3}He,d)=1+3 for a group at 3345.
3351.462 *30*	$(2)^{+}$	90 fs *9*	B iJ O Q	XREF: i(3345). J^{π}: M1+E2 γ to 2^{+}; γ to 0^{+}; γs to 0^{+} and 3^{-}.
3376.37 *12*	$1^{(+)},2^{+}$	77 fs *+49−29*	i O	XREF: i(3378). J^{π}: γ to 0^{+} can only be D,E2 from RUL; L(^{3}He,d)=1+3 from $3/2^{-}$ for a group at 3378 could correspond to 3376.3+3377.2 levels.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
3377.0 *4*	$(1^+,2^+,3^+)$		B i	XREF: i(3378). J^{π}: γ to 2^+; L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3378 could correspond to 3376.3+3377.2 levels.
3403.82 *9*	$(2^+,3^+,4^+)$	32.6 fs *35*	O	J^{π}: 592γ to 3^+ can't be pure E1, E2 or M2 based on RUL; γ to 4^+. Note that (5^+) is proposed in (n,n'γ), but it would require a B(E2)(W.u.)=5.5×10^3 *+7−6* for 592γ, which greatly exceeds RUL=300.
3405.9 *7*	(1)	205 fs *33*	L	J^{π}: (D) γ to 0^+.
3407.91 *4*	(4^+)	0.52 ps *+56−19*	OP	J^{π}: L(p,p')=4.
3417 *10*	$-$		I	J^{π}: L(^{3}He,d)=4 from $3/2^-$ suggests J=2 to 6.
3432.31[d] *33*	7^+	0.8 ps *+4−2*	E G	J^{π}: ΔJ=2, E2 γ to 5^+ and ΔJ=1, M1 γ to 6^+.
3436.09 *16*	$1^{(+)},2^+$	63 fs *5*	I O	J^{π}: γs to 0^+ can only be D,E2; (M1+E2) γ to 2^+.
3441.27 *22*	(3^-)		OP W	XREF: W(3458). J^{π}: L(p,p')=3. Also L(p,t)=(3,4).
3441.54[e] *26*	7^-	3.6 ps *7*	G	J^{π}: ΔJ=2, E2 γ to 5^- and γ to 6^+.
3459.13 *5*	(2^+)		B I Q	XREF: I(3467). J^{π}: ε feeding (log *ft*=6.6) from 1^-; γs to 3^+ and 3^-; L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3467.
3466.39 *11*	(1,2,3)		B O	XREF: O(?). J^{π}: γs to 2^+ and 2^-.
3475 *4*	(4^+)		P	J^{π}: L(p,p')=4.
3528.69 *30*	1^+	50 fs *5*	I L O r	XREF: O(?). J^{π}: L(^{3}He,d)=1+3 from $3/2^-$; dipole γ to 0^+ from $\gamma(\theta)$. $T_{1/2}$: from (γ,γ').
3552.89 *7*	(1,2)		B i r	XREF: i(3558)r(3540). J^{π}: 2431γ to 0^+.
3556.210 *29*	(2^-)		B iJ Qr	XREF: i(3558). J^{π}: γs to 1^+ and 4^-; ε feeding (log *ft*=6.4) from 1^-.
3566.6 *10*	$1^{(+)}$	157 fs *24*	i L P	XREF: i(3558). J^{π}: dipole γ to 0^+ in (γ,γ'); L(^{3}He,d)=(1+3) for a group at 3558.
3604.192 *33*	1^+	55 fs *5*	B IJ L Q W	XREF: I(3598)W(3591). J^{π}: ε feeding (log *ft*=6.4) from 1^-; γ to 0^+ can only be D,E2 from RUL; L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3598; dipole γ to 0^+ in (γ,γ').
3636.88 *6*	(2^+)		B I P	J^{π}: γs to 0^+ and (3^-); L(^{3}He,d)=(1+3) for a group at 3634.
3651.88 *9*	$(1^+,2^+,3^+)$		B iJ p	XREF: i(3659)p(3655). J^{π}: L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3659 and γs to 1^+ and 3^+ suggests $(1^+,2^+,3^+)$. But L(p,p')=(4) for a 3655 group suggests (4^+) and may indicate a different level.
3657.7? *4*	(1,2)		i Op	XREF: i(3659)O(?)p(3655). J^{π}: 3657.8γ to 0^+.
3670.2 *4*	$1^{(+)}$	73 fs *8*	i L	XREF: i(3659). J^{π}: dipole γ to 0^+; L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3659.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^π[#]	$T_{1/2}$[‡]	XREF	Comments
3696.27 *28*	(7^-)	28 ps *7*	G	J^π: ΔJ=1, (M1+E2) γ to (6^-);and DJ=(0) γ to 7^-.
3697 *4*	$1^+,2^+,3^+$[&]		I P W	
3716.52 *6*	(2)		B	J^π: ε feednig (log *ft*=7.4 from 1^-); ΔJ=0,2 γ to 2^+.
3730.8 *10*	(3^-)		J P	J^π: L(p,p′)=3.
3752.1 *14*	$1^{(+)}$	175 fs *50*	I L	XREF: I(3741). J^π: L(^{3}He,d)=1+3 from $3/2^-$; dipole γ to 0^+.
3758.79 *20*	1	6.0 fs *6*	L	J^π: dipole γ to 0^+.
3776 *4*	(4^+)		P	J^π: L(p,p′)=4.
3785.7 *4*	(8^+)	0.9 ps *+5−3*	G	J^π: ΔJ=0,2 γ to 6^+; γ to 8^+ is likely dipole from RUL.
3790	$(\leq3^+)$		I	J^π: L(^{3}He,d)=1(+3) from $3/2^-$.
3806 *4*	(5^-)		P	J^π: L(p,p′)=5.
3808 *10*	$1^+,2^+,3^+$[&]		I	
3853.75[c] *33*	$(8)^+$	0.23 ps *+8−5*	E G	J^π: DJ=(0), M1+E2 γ to 8^+ and γ to 6^+.
3857.8 *11*	1^+	171 fs *35*	I L	J^π: L(d,^{3}He)=1+3 from $3/2^-$; dipole γ to 0^+.
3861.11 *32*	(4^+)		J P W	XREF: P(3862)W(3843). J^π: L(p,p′)=4. Level in (p,t) probably corresponds to this level rather than 3857, 1^+.
3880.46 *18*			B	
3906.39 *30*	$1^+,2^+,3^+$[&]		IJ	
3915.48 *5*	(2^-)		B J	J^π: γs to 1^+ and 4^-; possible ε feeding (log *ft*=7.0 from 1^-).
3917 *4*	(4^+)		P	J^π: L(p,p′)=4.
3922.5 *4*	1	42 fs *4*	L	J^π: dipole γ to 0^+.
3930.02 *6*	$(1,2^+)$		B J	XREF: J(3926.9). J^π: ε feeding (log *ft*=7.0) from 1^-; 1759γ to 0^+.
3932.7 *4*			J	
3948 *4*	(4^+)		P	J^π: L(p,p′)=4.
3970.407 *32*	(2^+)		B I	XREF: I(3955). J^π: ε feeding (log *ft*=6.4) from 1^-; γ to (30); L(^{3}He,d)=1+3 from $3/2^-$ for a group at 3955.
4001.81 *23*	(3^-)		IJ P W	XREF: W(3980). J^π: L(p,p′)=3. But L(^{3}He,d)=(1+3) from $3/2^-$ suggests $(1^+,2^+,3^+)$.
4005.1 *8*			G	Additional information 2. J^π: γ to (7^-) suggests (7,8,9).
4008.7[f] *6*	(8^-)	2.2 ps *7*	G	J^π: ΔJ=2, E2 γ to 6^-.
4045.61 *10*	1^+	31.1 fs *29*	B iJ L P	XREF: i(4054). J^π: dipole γ to 0^+; γ to 3^+ can only be D,E2.
4055.22 *30*	1^+	29.3 ps *26*	i LM	XREF: i(4054). J^π: M1 γ to 0^+.
4083.68 *6*	$(1^-,2)$		B	J^π: ε feeding (log *ft*=6.9) from 1^-; γ to 3^-.
4086.58 *19*	$(1,2,3^+)$		B	J^π: γs to 1^+, 2^+, 2^-.
4119 *4*	$2^-,3^-,4^-$		I P	XREF: I(4103). J^π: L(^{3}He,d)=2+4 from $3/2^-$.
4125.5 *10*	1^+	123 fs *25*	I LM	XREF: I(4137). J^π: M1 γ to 0^+. $T_{1/2}$: weighted average of 134 fs *25* from (γ,γ') and 98 fs *38* from (pol γ,γ').
4151.36 *6*	(2)		B	J^π: ε feeding (log *ft*=7.2 from 1^-); γs to 3^+ and 3^-.
4170 *4*	(4^+)		i P w	J^π: L(p,p′)=4.
4174.33 *6*	(1,2)		B i w	J^π: ε feeding (log *ft*=6.7) from 1^-; 2383γ to 0^+.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
4199.19 *5*	(1^-,2)		B w	J^{π}: ε feeding (log *ft*=6.8) from 1^-; γ to 3^-.
4205.44 *5*	(1^-,2)		B J w	J^{π}: ε feeding (log *ft*=6.9) from 1^-; γ to 3^-.
4214.0 *4*	(8^-)	1.7 ps *+15−8*	G	J^{π}: ΔJ=2, E2 γ to (6^-).
4218 *4*	(3^-)		P	J^{π}: L(p,p′)=3.
4218.81 *10*	1^+	2.98 fs *35*	I LM	XREF: I(4218). J^{π}: M1 γ to 0^+.
4240.54 *21*	(1 to 4)[a]		iJ P	XREF: i(4250).
4249.20 *28*	(1,2)		B i	XREF: i(4250). J^{π}: 4249γ to 0^+.
4257.59 *13*	(1,2)		B iJ	XREF: i(4250). J^{π}: 2087γ to 0^+.
4282.8 *4*	(2^-,3^-,4^-)		iJ	XREF: i(4301). J^{π}: L(^{3}He,d)=2+4 from $3/2^-$.
4298.87 *9*	(1,2,3^+)		B i	XREF: i(4301). J^{π}: γs to 1^+, 2^-, 2^+.
4299.5[b] *5*	10^+	0.49 ps *+10−7*	E G	J^{π}: ΔJ=2, E2 γ to 8^+; member of rotational band.
4324.6[e] *6*	$(9)^-$	1.4 ps *4*	G	J^{π}: ΔJ=2, E2 γ to 7^-; band assignmetn.
4328.36 *7*	(1,2)		B	J^{π}: 4328γ to 0^+.
4329.2 *4*	1	6.1 fs *15*	L	J^{π}: $\gamma(\theta)$ in (γ,γ'); dipole γ to 0^+ and 2^+.
4340 *4*	(3^-)		i P	J^{π}: L(p,p′)=3.
4347.53 *33*	(1,2)		B i	XREF: i(4343). J^{π}: 4347γ to 0^+.
4351.3 *7*	(1 to 4)[a]		iJ	XREF: i(4343).
4366.55 *11*			B	J^{π}: γs to 2^+ and 3^+.
4369.43 *22*	(4^+)		IJ	XREF: I(4375). J^{π}: L(p,p′)=4.
4383.97 *15*	1^+,2^+,3^+[&]		IJ	XREF: I(4400).
4399 *4*	(4^+)		P	J^{π}: L(p,p′)=4.
4405.9[d] *4*	(9^+)	0.9 ps *2*	E G	J^{π}: ΔJ=2, (E2) γ to 7^+; band assignment.
4411.65 *4*	(2)		B	J^{π}: ε feeding (log *ft*=6.3) from 1^-; γs to 3^+ and 3^-.
4425 *10*	(3^-,4^+)		W	J^{π}: L(p,t)=(3,4) frm 0^+.
4437.72 *5*	(1^+,2^+)		B I p	XREF: I(4425)p(4447). J^{π}: ε feeding (log *ft*=6.6) from 1^-; 2267γ to 0^+; L(^{3}He,d)=1+3 for a group at 4425.
4451.92 *11*	(1^+,2^+)		B I	XREF: I(4459). J^{π}: 4451.8γ to 0^+; L(^{3}He,d)=1+3 from $3/2^-$ for a group at 4459.
4473.46 *8*	(2^+)		B iJ P	XREF: i(4475). J^{π}: L(p,p′)=(2).
4489.23 *6*	(1,2)		B iJ	XREF: i(4475). J^{π}: 2698γ to 0^+.
4523.47 *10*	(3^-)		B IJ P	J^{π}: L(p,p′)=3.
4532.91 *12*	(1^-,2,3)		B	J^{π}: γs to 2^+, 2^-, 3^-.
4534.93 *8*	(0,1,2)		B	J^{π}: ε feeding (log *ft*=6.7 from 1^-).
4535.7 *5*	1^+	10.1 fs *17*	LM	J^{π}: M1 γ to 0^+. $T_{1/2}$: from (γ,γ'). Other: 10.1 fs *24* from (pol γ,γ').
4576.11 *19*	(1,2)		B I	XREF: I(4567). J^{π}: 3453.8γ to 0^+.
4581.05 *10*	(1,2)		B	J^{π}: ε feeding (log *ft*=6.6) from 1^-; 2152γ to 3^-.
4603.26 *28*	$(1,2)^+$		B I	XREF: I(4603). J^{π}: 4603γ to 0^+; L(^{3}He,d)=1+3 from $3/2^-$.
4603.3 *6*	1^-	8.0 fs *24*	M	J^{π}: E1 γ to 0^+.
4611 *4*	(3^-)		P	J^{π}: L(p,p′)=3.
4647 *10*	1^+,2^+,3^+[&]		I	

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
4658 *4*	(3$^-$)		I P	XREF: I(4677). J^{π}: L(p,p′)=3 and L(^{3}He,d)=2+4 from 3/2$^-$.
4663.08 *31*	1$^-$	5.4 fs *9*	LM	J^{π}: E1 γ to 0$^+$.
4673.7 *14*	1$^+$	54 fs *18*	M	J^{π}: M1 γ to 0$^+$.
4687.21 *11*	(1,2,3$^+$)		B	J^{π}: γs to 1$^+$, (3).
4687.3[c] *4*	(10)$^+$	0.49 ps *7*	E G	J^{π}: ΔJ=2, E2 γ to 8$^+$ and γ to (10)$^+$.
4720.6 *5*	1$^-$	6.4 fs *9*	B LM	J^{π}: E1 γ to 0$^+$ and 2$^+$. $T_{1/2}$: from (γ,γ'). Other: 6.4 fs *10* from (pol γ,γ').
4723.2 *4*	(3$^+$)		B i P	XREF: i(4729). J^{π}: L(^{3}He,d)=1+3 from 3/2$^-$ for a 4729 group gives 1$^+$,2$^+$,3$^+$ and L(p,p′)=4 gives 4$^+$. However, J^{π}=3$^+$ would agree with both if unnatural parity state is populated in (p,p′).
4728.6 *6*			G	J^{π}: γ to 7$^-$ suggests (7,8,9). $T_{1/2}$: for a 1287γ, from DSAM 1981KiZW report $T_{1/2}$=0.6 ps *1*, but this value is not reported in authors′ published work (1984Zo01).
4731.6 *4*	($^+$)		B i	XREF: i(4729). J^{π}: L(^{3}He,d)=1+3 from 3/2$^-$ for a 4729 group gives 1$^+$,2$^+$,3$^+$.
4751.6 *5*	1$^+$,2$^+$,3$^+$[&]		IJ	
4766.96 *30*	1	17.4 fs *15*	L	J^{π}: dipole γ to 0$^+$.
4771 *4*	(3$^-$)		P	J^{π}: L(p,p′)=(3).
4794.97 *13*	(1,2)		B	J^{π}: 3672.5γ to 0$^+$.
4811 *4*	1$^+$,2$^+$,3$^+$[&]		I P	
4836 *10*	1$^+$,2$^+$,3$^+$[&]		I	
4859 *4*	($^+$)		I P	J^{π}: L(^{3}He,d)=1+3 from 3/2$^-$ allows (1$^+$,2$^+$,3$^+$) but L(p,p′)=4 suggests 4$^+$. However, J^{π}=3$^+$ agrees with both if an unnatural parity state is populated in (p,p′).
4880.0 *4*	1$^-$	19.7 fs *19*	LM	J^{π}: E1 γ to 0$^+$. $T_{1/2}$: weighted average of 19.9 fs *19* from (γ,γ') and 19 fs *4* from (pol γ,γ').
4887.07 *30*	1$^-$	27.0 fs *33*	LM	J^{π}: E1 γ to 0$^+$. $T_{1/2}$: from (γ,γ'). Other: 27 fs *9* from (pol γ,γ').
4911 *10*	1$^+$,2$^+$,3$^+$[&]		I	
4931.6 *17*	1$^-$	79 fs *21*	LM	J^{π}: E1 γ to 0$^+$.
4935 *4*	(3$^-$)		I P	J^{π}: L(p,p′)=3.
4938.6 *15*	1	43 fs *8*	L	J^{π}: dipole γ to 0$^+$.
4971.5 *17*	1$^+$	38 fs *7*	I L	J^{π}: L(^{3}He,d)=1+3 FROM 3/2$^-$; dipole γ to 0$^+$.
4984.81 *31*	1$^-$	6.0 fs *8*	LM	J^{π}: E1 γ to 0$^+$. $T_{1/2}$: from (γ,γ'). Other: 6.0 fs *11* from (pol γ,γ').
4998 *4*	1$^+$,2$^+$,3$^+$[&]		I P	XREF: I(5013).
5001.48 *20*	1$^-$	8.4 fs *6*	M	J^{π}: E1 γ to 0$^+$.
5010.76 *21*	1$^-$	3.65 fs *35*	LM	J^{π}: E1 γ to 0$^+$. $T_{1/2}$: from (γ,γ'). Other: 3.7 fs *7* from (pol γ,γ').
5032.11 *19*	(2$^-$,3$^-$,4$^-$)		IJ	XREF: I(5043). J^{π}: L(^{3}He,d)=2+4 from 3/2$^-$.
5068.1[f] *8*	(10)$^-$	1.0 ps *+4−2*	G	J^{π}: ΔJ=2, E2 γ to (8)$^-$; band assignment.
5074.00 *10*	1$^-$	2.44 fs *15*	LM	J^{π}: E1 γ to 0$^+$. $T_{1/2}$: from (γ,γ'). Other: 2.43 fs *28* from (pol γ,γ').
5081 *4*	(3)$^-$		I P	J^{π}: L(^{3}He,d)=2+4 from 3/2$^-$ and L(p,p′)=3.
5122.19 *20*	1	35 fs *8*	L	J^{π}: dipole γ to 0$^+$.
5128.59 *10*	1	25 fs *4*	L	J^{π}: dipole γ to 0$^+$.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
5139.9 *5*	(1 to 4)[a]		J	
5142.3 *7*	1	26.1 fs *32*	L	J^{π}: dipole γ to 0^+.
5174 *4*	(3^-)		P	J^{π}: L(p,p′)=3.
5195.00 *15*	1^-	2.27 fs *17*	J LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: from (γ,γ'). Other: 2.29 fs *28* from (pol γ,γ').
5217.8 *11*	1^-	12.1 fs *26*	M	J^{π}: E1 γ to 0^+.
5239.6 *8*	1	9.6 fs *15*	L	J^{π}: dipole γ to 0^+.
5261 *4*	(4^+)		P	J^{π}: L(p,p′)=4.
5284.40 *30*	1	8.4 fs *6*	L	J^{π}: dipole γ to 0^+.
5297.90 *30*	(1^+)	13.7 fs *8*	M	J^{π}: (M1) γ to 0^+.
5298.60 *10*	1^-	1.98 fs *11*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: 3.56 fs *23* in (pol γ,γ'), where only the 5298γ from this level was listed.
5303 *4*	(3^-)		P	J^{π}: L(p,p′)=3.
5324.18 *29*	1^-	3.12 fs *35*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: other: 8.8 fs *7* in (γ,γ'), where only the 5324γ from this level was listed.
5346.94 *23*	1^-	3.4 fs *4*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: from (γ,γ'). Other: 3.5 fs *8* from (pol γ,γ').
5367.5 *13*	1	44 fs *10*	L	J^{π}: dipole γ to 0^+.
5368.3[d] *5*	(11^+)		E	J^{π}: γ to $(10)^+$; band assignment.
5375.45 *18*	1^-	1.43 fs *13*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: from (γ,γ'). Other: 1.46 fs *14* from (pol γ,γ').
5405.2 *18*	1^-	26 fs *8*	M P	J^{π}: E1 γ to 0^+.
5411.33 *29*	1^-	1.53 fs *33*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: from (γ,γ'). Other: 1.5 fs *4* from (pol γ,γ').
5425.21 *26*	1^-	3.6 fs *4*	LM	J^{π}: E1 γ to 0^+.
5431.8[b] *6*	12^+	0.2 ps *1*	E G	J^{π}: ΔJ=2, (E2) γ to 10^+; member of rotaional band.
5510 *10*			I	
5551.8 *15*	1^-	9.4 fs *24*	M	J^{π}: E1 γ to 0^+.
5629.8 *15*	1^-	24 fs *8*	M	J^{π}: E1 γ to 0^+.
5637.7 *15*	1^-	24 fs *8*	M	J^{π}: E1 γ to 0^+.
5669.2 *15*	1^-	22 fs *8*	M	J^{π}: E1 γ to 0^+.
5685.5 *4*	1^-	8.0 fs *7*	LM	J^{π}: E1 γ to 0^+.
5709.8 *4*	1^-	7.4 fs *7*	LM	J^{π}: E1 γ to 0^+.
5740.73 *30*	1^-	5.6 fs *5*	LM	J^{π}: E1 γ to 0^+.
5762.0 *10*	1^-	15.7 fs *34*	M	J^{π}: E1 γ to 0^+.
5773.3 *10*	1^-	17.9 fs *26*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 19.2 fs *32* from (γ,γ') and 17.1 fs *26* from (pol γ,γ').
5781.24 *20*	1^-	3.94 fs *29*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 3.90 fs *29* from (γ,γ') and 4.4 fs *10* from (pol γ,γ').
5796.7[c] *5*	(12^+)		E	J^{π}: γ to 10^+; band assignment.
5804.0 *6*	1^-	2.8 fs *6*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 3.1 fs *8* from (γ,γ') and 2.6 fs *6* from (pol γ,γ').
5813.9 *5*	1^-	8.0 fs *8*	LM	J^{π}: E1 γ to 0^+.
5842.31 *29*	1^-	3.1 fs *4*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 3.28 fs *24* from (γ,γ') and 2.1 fs *6* from (pol γ,γ').
5865.3 *7*	1^-	7.6 fs *11*	M	J^{π}: E1 γ to 0^+.
5879.6 *6*	1^-	14.8 fs *19*	LM	J^{π}: E1 γ to 0^+.
5892.30 *31*	1^-	3.4 fs *5*	LM	J^{π}: E1 γ to 0^+.
5939.0 *5*	(1 to 4)[a]		J	

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)†	J$^{\pi}$#	T$_{1/2}$‡	XREF	Comments
5996.1 *9*	1$^-$	5.3 fs *12*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: other: 0.94 fs *21* in (γ,γ').
6005 *10*			I	
6035.4 *5*	1$^-$	2.6 fs *4*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: other: 6.1 fs *6* in (γ,γ') for only the 6035γ.
6099.3 *4*	1$^-$	2.8 fs *5*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6131.5 *6*	1$^-$	11.5 fs *18*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6156.6 *14*	1$^-$	55 fs *10*	M	J$^{\pi}$: E1 γ to 0$^+$.
6165.1 *11*	1$^-$	21 fs *6*	M	J$^{\pi}$: E1 γ to 0$^+$.
6196.2 *11*	1$^-$	10.0 fs *13*	M	J$^{\pi}$: E1 γ to 0$^+$.
6208.7 *15*	1$^-$	5.0 fs *10*	M	J$^{\pi}$: E1 γ to 0$^+$.
6242.7 *6*	1$^-$	2.6 fs *11*	LM	XREF: L(6247.4). E(level): evaluators assume that 6242.7 in (pol γ,γ') and 6247.4 in (γ,γ') correspond to the same level. J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: other: 4.6 fs *6* in (γ,γ').
6250.7 *5*	1$^-$	5.6 fs *8*	LM	XREF: L(6254.0). E(level): evaluators assume that 6250.7 in (pol γ,γ') and 6254.0 in (γ,γ') correspond to the same level. J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: weighted average of 5.5 fs *8* from (γ,γ') and 5.8 fs *15* from (pol γ,γ').
6297.9 *14*	1$^-$	10.0 fs *15*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6315.9 *4*	1$^-$	3.1 fs *4*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: weighted average of 2.97 fs *25* from (γ,γ') and 5.1 fs *12* from (pol γ,γ').
6336.8 *20*	1$^-$	4.4 fs *23*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: unweighted average of 6.6 fs *13* from (γ,γ') and 2.1 fs *10* from (pol γ,γ').
6342.64 *29*	1$^-$	0.28 fs *7*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: other: 5.1 fs *8* in (γ,γ') from only the 6342γ.
6387.5 *14*	1$^-$	6.7 fs *10*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6438.1 *19*	1	8.4 fs *19*	L	
6449.0 *20*	1$^-$	6.1 fs *10*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6497.7 *6*	1$^-$	3.6 fs *14*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: unweighted average of 5.0 fs *6* from (γ,γ') and 2.2 fs *7* from (pol γ,γ').
6500.8^d *6*	(13$^+$)		E	
6532.7 *4*	1$^-$	3.05 fs *28*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6551.00 *30*	1$^+$	11.0 fs *19*	LM	J$^{\pi}$: M1 γ to 0$^+$.
6562.9 *9*	1$^-$	7.69 fs *28*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: from (pol γ,γ'). Other: 8.1 fs *15* from (γ,γ').
6570.4 *9*	1$^-$	4.9 fs *6*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6596.2 *7*	1$^-$	5.5 fs *7*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6608.5 *9*	1$^-$	6.0 fs *8*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6631.8 *7*	1$^-$	1.39 fs *28*	LM	J$^{\pi}$: E1 γ to 0$^+$.
6641.3 *17*	1$^-$	5.5 fs *12*	M	J$^{\pi}$: E1 γ to 0$^+$.
6653.7 *14*	1$^-$	3.3 fs *7*	M	J$^{\pi}$: E1 γ to 0$^+$.
6680.0 *18*	1$^-$	6.1 fs *7*	M	J$^{\pi}$: E1 γ to 0$^+$.
6691.5 *8*	1$^-$	9.9 fs *16*	LM	J$^{\pi}$: E1 γ to 0$^+$. T$_{1/2}$: weighted average of 9.6 fs *16* from (γ,γ') and 10.2 fs *17* from (pol γ,γ').
6700.3 *20*	1$^-$	8.2 fs *21*	M	J$^{\pi}$: E1 γ to 0$^+$.
6709.0 *21*	1$^-$	9.1 fs *25*	M	J$^{\pi}$: E1 γ to 0$^+$.
6736.2 *15*	1$^-$	9.1 fs *25*	M	J$^{\pi}$: E1 γ to 0$^+$.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
6743.31 *28*	1^-	1.11 fs *14*	LM	J^{π}: E1 γ to 0^+.
6749.2 *4*	1^-	1.32 fs *21*	LM	J^{π}: E1 γ to 0^+.
6751.5[b] *7*	(14^+)		E	
6813.9 *20*	1^-	16 fs *6*	M	J^{π}: E1 γ to 0^+.
6830.2 *15*	1^-	8.3 fs *18*	M	J^{π}: E1 γ to 0^+.
6882.7 *6*	1^-	1.52 fs *28*	LM	J^{π}: E1 γ to 0^+.
6908.3 *20*	1^-	15 fs *4*	M	J^{π}: E1 γ to 0^+.
6913.3 *17*	1^+	14 fs *4*	M	J^{π}: M1 γ to 0^+.
6922.2 *18*	1^-	12.6 fs *33*	M	J^{π}: E1 γ to 0^+.
6970.3 *5*	1^-	4.0 fs *9*	LM	XREF: L(6973.0). E(level): evaluators assume that 6970.3 in (pol γ,γ') and 6973.0 in (γ,γ') correspond to the same level. J^{π}: E1 γ to 0^+.
6992.9 *5*	1^-	3.3 fs *5*	LM	J^{π}: E1 γ to 0^+.
7018.1 *18*	1^-	11 fs *5*	M	J^{π}: E1 γ to 0^+.
7025.1 *20*	1^+	12 fs *4*	M	J^{π}: E1 γ to 0^+.
7047.4 *15*	1^+	14 fs *5*	M	J^{π}: E1 γ to 0^+.
7053.1 *19*	1^-	12.5 fs *37*	M	J^{π}: E1 γ to 0^+.
7084.5[c] *6*	(14^+)		E	
7093.1 *20*	1^-	11.2 fs *30*	M	J^{π}: E1 γ to 0^+.
7101.1 *19*	1^-	11.4 fs *35*	M	J^{π}: E1 γ to 0^+.
7110.1 *19*	1^+	10.0 fs *29*	M	J^{π}: M1 γ to 0^+.
7115.5 *12*	1^-	2.9 fs *10*	M	J^{π}: E1 γ to 0^+.
7128.4 *11*	1^-	0.80 fs *21*	M	J^{π}: E1 γ to 0^+.
7156.0 *17*	1^-	7.6 fs *21*	M	J^{π}: E1 γ to 0^+.
7168.1 *18*	1^-	11.8 fs *35*	M	J^{π}: E1 γ to 0^+.
7195.6 *14*	1^-	6.3 fs *18*	M	J^{π}: E1 γ to 0^+.
7225.6 *20*	1^-	6.0 fs *15*	M	J^{π}: E1 γ to 0^+.
7241.6 *7*	1^-	4.5 fs *8*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 4.3 fs *8* from (γ,γ') and 4.9 fs *10* from (pol γ,γ').
7292.8 *15*	1^-	4.0 fs *10*	M	J^{π}: E1 γ to 0^+.
7324.6 *18*	1^-	8.3 fs *24*	M	J^{π}: E1 γ to 0^+.
7335.0 *20*	1^-	10.3 fs *33*	M	J^{π}: E1 γ to 0^+.
7342.2 *14*	1^-	4.6 fs *12*	M	J^{π}: E1 γ to 0^+.
7362.2 *21*	1^-	12 fs *4*	M	J^{π}: E1 γ to 0^+.
7392.6 *8*	1^-	13 fs *4*	M	J^{π}: E1 γ to 0^+.
7406.0 *11*	1^-	2.4 fs *12*	M	J^{π}: E1 γ to 0^+.
7427.1 *14*	1^-	4.2 fs *11*	M	J^{π}: E1 γ to 0^+.
7455.5 *13*	1^-	3.9 fs *13*	LM	XREF: L(7457.6). E(level): evaluators assume that 7455.5 in (pol γ,γ') and 7457.6 in (γ,γ') correspond to the same level. J^{π}: E1 γ to 0^+. $T_{1/2}$: unweighted average of 5.1 fs *10* from (γ,γ') and 2.6 fs *6* from (pol γ,γ').
7464.9 *14*	1^-	1.8 fs *6*	M	J^{π}: E1 γ to 0^+.
7508.4 *8*	1^-	4.0 fs *5*	LM	J^{π}: E1 γ to 0^+.
7522.7 *5*	1^-	1.18 fs *21*	LM	J^{π}: E1 γ to 0^+.
7546.9 *6*	1^-	1.63 fs *14*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 1.59 fs *14* from (γ,γ') and 1.66 fs *14* from (pol γ,γ').
7580.5 *16*	1^-	8.3 fs *23*	M	J^{π}: E1 γ to 0^+.
7617.2 *17*	1^-	5.5 fs *11*	M	J^{π}: E1 γ to 0^+.
7627.8 *15*	1^-	4.1 fs *8*	M	J^{π}: E1 γ to 0^+.
7643.3 *17*	1^-	7.5 fs *19*	M	J^{π}: E1 γ to 0^+.

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
7652.9 *17*	1^-	4.1 fs *8*	M	J^{π}: E1 γ to 0^+.
7658.71 *20*	1^-	6.4 fs *10*	LM	J^{π}: E1 γ to 0^+.
7698.3 *8*	1^-	0.97 fs *28*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: other: 2.22 fs *28* in (γ,γ') from only the 7698γ.
7729.7 *16*	1^-	3.7 fs *8*	M	J^{π}: E1 γ to 0^+.
7781.6 *18*	1^-	6.9 fs *22*	M	J^{π}: E1 γ to 0^+.
7817.5 *10*	1^-	9.7 fs *35*	M	J^{π}: E1 γ to 0^+.
7830.0 *9*	1^-	9.0 fs *35*	M	J^{π}: E1 γ to 0^+.
7846.9[d] *7*	(15^+)		E	
7866.1 *17*	1^-	8.3 fs *27*	M	J^{π}: E1 γ to 0^+.
7890.9 *18*	1^-	7.8 fs *25*	M	J^{π}: E1 γ to 0^+.
7920.1 *17*	1^-	5.1 fs *16*	M	J^{π}: E1 γ to 0^+.
7927.6 *17*	1^-	5.3 fs *17*	M	J^{π}: E1 γ to 0^+.
7952.1 *21*	1^-	7.1 fs *24*	M	J^{π}: E1 γ to 0^+.
7960.4 *18*	1^-	5.9 fs *19*	M	J^{π}: E1 γ to 0^+.
7979.0 *8*	1^-	3.0 fs *6*	LM	J^{π}: E1 γ to 0^+. $T_{1/2}$: weighted average of 2.8 fs *6* from (γ,γ') and 3.3 fs *8* from (pol γ,γ').
8017.9 *23*	1^-	6.6 fs *21*	M	J^{π}: E1 γ to 0^+.
8062.5 *22*	1^-	5.4 fs *17*	M	J^{π}: E1 γ to 0^+.
8082.7 *18*	1^-	2.3 fs *8*	M	J^{π}: E1 γ to 0^+.
8107.3 *22*	1^-	5.7 fs *17*	M	J^{π}: E1 γ to 0^+.
8132.1 *22*	1^-	5.7 fs *17*	M	J^{π}: E1 γ to 0^+.
8154.9 *21*	1^-	6.5 fs *19*	M	J^{π}: E1 γ to 0^+.
8170.1 *22*	1^-	6.0 fs *17*	M	J^{π}: E1 γ to 0^+.
8198.0 *10*	1^-	0.76 fs *14*	LM	J^{π}: E1 γ to 0^+.
8210.5 *20*	1^-	4.0 fs *10*	M	J^{π}: E1 γ to 0^+.
8222.5 *20*	1^-	2.5 fs *6*	M	J^{π}: E1 γ to 0^+.
8251.9 *23*	1^-	12 fs *5*	M	J^{π}: E1 γ to 0^+.
8268.5[b] *8*	(16^+)		E	
8288.5 *23*	1^-	3.6 fs *9*	M	J^{π}: E1 γ to 0^+.
8316.7 *22*	1^-	6.1 fs *21*	M	J^{π}: E1 γ to 0^+.
8340.7 *10*	1^-	4.4 fs *13*	M	J^{π}: E1 γ to 0^+.
8394.9 *19*	1^-	2.50 fs *35*	LM	J^{π}: E1 γ to 0^+.
8453.5 *21*	1^-	2.8 fs *7*	M	J^{π}: E1 γ to 0^+.
8486.5 *18*	1^-	0.91 fs *23*	M	J^{π}: E1 γ to 0^+.
8528.1 *4*	1^-	0.48 fs *10*	LM	J^{π}: E1 γ to 0^+.
8539.8 *11*	1^-	0.94 fs *17*	M	J^{π}: E1 γ to 0^+.
8571.7 *19*	1^-	1.7 fs *5*	M	J^{π}: E1 γ to 0^+.
8573.8[c] *8*	(16^+)		E	
8590.1 *20*	1^-	2.3 fs *8*	M	J^{π}: E1 γ to 0^+.
8654.9 *19*	1^-	2.0 fs *6*	M	J^{π}: E1 γ to 0^+.
8709.9 *13*	1^-	1.66 fs *28*	LM	J^{π}: E1 γ to 0^+.
8719.5 *21*	1^-	3.0 fs *10*	M	J^{π}: E1 γ to 0^+.
8770.9 *23*	1^-	1.9 fs *6*	M	J^{π}: E1 γ to 0^+.
8843.4 *14*	1^-	0.83 fs *42*	M	J^{π}: E1 γ to 0^+.
8864.8 *20*	1^-	2.9 fs *9*	M	J^{π}: E1 γ to 0^+.
8890.8 *19*	1^-	2.1 fs *6*	M	J^{π}: E1 γ to 0^+.
8918.8 *19*	1^-	2.1 fs *6*	M	J^{π}: E1 γ to 0^+.
8935.6 *20*	1^-	2.6 fs *8*	M	J^{π}: E1 γ to 0^+.
9394.7[d] *8*	(17^+)		E	
9963.8[b] *10*	(18^+)		E	
11147.1[d] *10*	(19^+)		E	
(11154.19 *7*)	$2^+,3^+$		J	J^{π}: s-wave capture in ^{75}Se (g.g. J^{π}=5/2$^+$).

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Adopted Levels, Gammas (continued)

^{76}Se Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
			E(level): S(n)=11153.79 *7* (2021Wa16).
11774.8[b] *11*	(20$^+$)	E	
12528[@]		K	
12578[@]		K	
12678[@]		K	
12718[@]		K	
12788[@]		K	
12888[@]		K	
12938[@]		K	
13138[@]		K	
13278[@]		K	
13418[@]		K	
13478[@]		K	
13528[@]		K	
13598[@]		K	
13681.3[b] *12*	(22$^+$)	E	
13728[@]		K	
13928[@]		K	
14038[@]		K	
14118[@]		K	
14198[@]		K	

[†] From a least squares fit to Eγ data for levels populated in γ-ray studies. In other cases, values are mainly from (^{3}He,d), (p,p′) and/or from primary transitions in (n,γ).

[‡] Unless otherwise indictated, values for high-spin states are from recoil-distance Doppler-shift (RDDS) or DSA methods in (α,2nγ) (1984Zo01), DSAM in (n,n′γ), (pol γ,γ'), and from cross section data in (γ,γ') for J=1 levels above 2900 keV.

[#] When deduced from $\gamma(\theta)$ in (α,2nγ), it is assumed that a γ-transition with large quadrupole component is E2 rather than M2, unless a long lifetime is indicated. Above /2800, values are given in parentheses when available only from L(p,p′) due to following reasons: 1. The agreement of $\sigma(\theta)$ fits to DWBA is not good over the whole angular range. 2. The correspondence between levels in different reactions is not unique due to large level density and large uncertainties in E(level) from particle reactions. Above 2900 keV, levels populated in (γ,γ') and (pol γ,γ') are primarily J=1 states, determined from $\gamma(\theta)$ and γ(pol) data.

[@] Isobaric analog resonances from ^{75}As(p,n). Uncertainty ≈25 keV. See ^{75}As(p,n) IAR for assignment to analog states in ^{76}As.

[&] L(^{3}He,d)=1+3 from 3/2$^-$.

[a] Primary γ from 2$^+$,3$^+$ in (n,γ).

[b] Band(A): Yrast band based on ground state. First band crossing at $\hbar\omega$≈0.55 MeV due to pair of $g_{9/2}$ neutrons, second crossing at $\hbar\omega$≈0.80 MeV, due to pair of $g_{9/2}$ protons, and interpreted as shape transition from prolate to oblate (2015Xu09). Band parameters are: E_0=196.0, A=51.8, B=−0.12.

[c] Band(B): γ band, even spin.

[d] Band(b): γ band, odd spin.

[e] Band(C): K^{π}=3$^-$ band. Band parameters are: E_0=2178.1, A=20.4, B=0.038.

[f] Band(D): ΔJ=2 band. Band parameters are: E_0=2514.8, A=15.3, B=0.072.

$\gamma(^{76}Se)$

Additional information 3.

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	$I_{(\gamma+ce)}$	Comments
559.103	2^+	559.099 *5*	100	0.0	0^+	E2		1.97×10^{-3} *3*		B(E2)(W.u.)=45.1 *+12−6* α(K)=0.001747 *24*; α(L)=0.0001872 *26*; α(M)=2.91×10^{-5} *4* α(N)=2.452×10^{-6} *34*
1122.279	0^+	563.171 *7*	100	559.103	2^+	E2		1.92×10^{-3} *3*		B(E2)(W.u.)=47 *11* α(K)=0.001710 *24*; α(L)=0.0001832 *26*; α(M)=2.85×10^{-5} *4* α(N)=2.400×10^{-6} *34*
		1122.3 *3*		0.0	0^+	E0			0.023 *5*	q^2_K(E0/E2)=0.133 *15*, X(E0/E2)=0.0246 *31*, ρ^2(E0)=0.035 *+14−13* (2022Ki03 evaluation). X(E0/E2)=0.023 *4* (1986Gi12); ρ(E0)=0.17 *4* (1986Gi12), 0.19 *4* (1983Pa10) from ce data in ^{76}Br ε decay.
1216.154	2^+	657.041 *5*	100.0 *22*	559.103	2^+	E2+M1(+E0)	+5.2 *2*	1.23×10^{-3} *2*		B(M1)(W.u.)=5.31×10^{-4} *+71−59*; B(E2)(W.u.)=44.7 *+45−38* α(K)=0.001090 *15*; α(L)=0.0001159 *16*; α(M)=1.802×10^{-5} *25* α(N)=1.524×10^{-6} *21* Mult.,δ: from $\gamma(\theta)$ in ^{76}As β^-. Others: +6 *1* ($\gamma\gamma(\theta)$ in ^{76}Br ε); +4.7 *+11−20* (α,2nγ). E0 from α(K)exp=0.00167 *15* (1970Dz09) in ^{76}Br ε decay. X(E0/E2)≤0.14; ρ(E0)≤0.41 (1986Gi12). q^2_K(E0/E2)=0.25 *14*, X(E0/E2)=0.11 *6*, ρ^2(E0)=0.140 *80*, %E0=19 (2022Ki03 evaluation).
		1216.149 *25*	58.0 *22*	0.0	0^+	E2		0.000281 *4*		B(E2)(W.u.)=1.24 *+13−11* α(K)=0.0002408 *34*; α(L)=2.508×10^{-5} *35*; α(M)=3.90×10^{-6} *5* α(N)=3.33×10^{-7} *5*; α(IPF)=1.090×10^{-5} *15* I_γ: NRM weighted average; low value of 37.7 *26* in (α,2nγ) is not used in averaging.
1330.872	4^+	771.757 *9*	100	559.103	2^+	E2		0.000800 *11*		B(E2)(W.u.)=71.1 *14* α(K)=0.000712 *10*; α(L)=7.52×10^{-5} *11*;

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									α(M)=1.170×10^{-5} *16* α(N)=9.93×10^{-7} *14*
1688.971	3$^+$	358.099 *7*	4.1 *17*	1330.872	4$^+$	(M1+E2)		0.0059 *21*	α(K)=0.0053 *19*; α(L)=5.7×10^{-4} *22*; α(M)=8.9×10^{-5} *33* α(N)=7.5×10^{-6} *27* B(M1)(W.u.)=0.0044 *21* if M1, B(E2)(W.u.)=46 *22* if E2. δ: +1.8 *+10−12* or +0.8 *+20−3* from (n,n′γ).
		472.813 *7*	36 *4*	1216.154	2$^+$	M1+E2	+3.20 *+27−24*	0.00316 *5*	B(M1)(W.u.)=0.00148 *44*; B(E2)(W.u.)=92 *+23−25* α(K)=0.00281 *4*; α(L)=0.000303 *5*; α(M)=4.71×10^{-5} *7* α(N)=3.95×10^{-6} *6* I_γ: unweighted average of available values. δ: from ^{76}Br ε decay. Others: +2.1 *9*, +0.75 *44* from $\gamma(\theta)$ in (α,2nγ); +0.01 to +0.73, >+2.5 or <−6.7 from $\gamma(\theta)$ in ^{76}As β^-.
		1129.873 *16*	100 *5*	559.103	2$^+$	E2+M1	+1.08 *10*	0.000309 *4*	B(M1)(W.u.)=0.00157 *+40−42*; B(E2)(W.u.)=1.93 *+47−53* α(K)=0.000275 *4*; α(L)=2.86×10^{-5} *4*; α(M)=4.44×10^{-6} *6* α(N)=3.80×10^{-7} *5*; α(IPF)=1.573×10^{-6} *33* δ: from $\gamma\gamma(\theta)$ in ^{76}As β^- decay. Others: +1.8 12 from $\gamma(\theta)$ in (α,2nγ), +0.57 to +3.55 from $\gamma(\theta)$ in ^{76}As β^-, +1.9 *2* from $\gamma\gamma(\theta)$ in ^{76}Br ε decay.
1787.655	2$^+$	456.77 *5*	3.06 *8*	1330.872	4$^+$	[E2]		0.00365 *5*	B(E2)(W.u.)=21.0 *+48−51* α(K)=0.00324 *5*; α(L)=0.000351 *5*; α(M)=5.46×10^{-5} *8* α(N)=4.58×10^{-6} *6*
		571.495 *9*	8.7 *10*	1216.154	2$^+$	(M1(+E2))	+0.13 *12*	1.29×10^{-3} *3*	B(M1)(W.u.)=0.0046 *+11−13*; B(E2)(W.u.)=0.32 *+80−29* α(K)=0.001148 *26*; α(L)=0.0001203 *29*; α(M)=1.87×10^{-5} *5* α(N)=1.60×10^{-6} *4* I_γ: NRM weighted average. High value of 31 from (n,n′γ) is not used. δ: from $\gamma\gamma(\theta)$ in ^{76}As β^- decay. Other: −0.13 *34* or >+1.37 from $\gamma(\theta)$ in ^{76}As β^-. Parity is from the Adopted Levels.
		665.361 *9*	32.3 *16*	1122.279	0$^+$	[E2]		1.19×10^{-3} *2*	B(E2)(W.u.)=33.7 *+77−82* α(K)=0.001062 *15*; α(L)=0.0001128 *16*;

From ENSDF

$^{76}_{34}Se_{42}$-16

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									α(M)=1.755×10^{-5} *25* α(N)=1.484×10^{-6} *21*
1787.655	2+	1228.600 *20*	100.0 *19*	559.103	2+	M1+E2	−0.51 *5*	0.000264 *4*	B(M1)(W.u.)=0.0043 *+10−11*; B(E2)(W.u.)=1.00 *28* α(K)=0.0002259 *32*; α(L)=2.340×10^{-5} *33*; α(M)=3.64×10^{-6} *5* α(N)=3.12×10^{-7} *4*; α(IPF)=1.042×10^{-5} *18* Mult.,δ: weighted average from $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in ^{76}As β^-. Others: −0.19 *5* from $\gamma\gamma(\theta)$ in ^{76}Br ε, −0.52 *+9−7* from (n,n′γ).
		1787.62 *2*	24.3 *7*	0.0	0+	[E2]		0.000333 *5*	B(E2)(W.u.)=0.181 *+42−44* α(K)=0.0001103 *15*; α(L)=1.139×10^{-5} *16*; α(M)=1.772×10^{-6} *25* α(N)=1.517×10^{-7} *21*; α(IPF)=0.0002089 *29*
1791.437	0+	575.28 *3*	100.0 *20*	1216.154	2+	(E2)		1.81×10^{-3} *3*	α(K)=0.001607 *22*; α(L)=0.0001719 *24*; α(M)=2.67×10^{-5} *4* α(N)=2.253×10^{-6} *32*
		1232.40 *5*	13.6 *4*	559.103	2+	(E2)		0.000276 *4*	α(K)=0.0002340 *33*; α(L)=2.436×10^{-5} *34*; α(M)=3.79×10^{-6} *5* α(N)=3.24×10^{-7} *5*; α(IPF)=1.373×10^{-5} *19*
2026.020	4+	239.11 *10*		1787.655	2+	[E2]		0.0333 *5*	α(K)=0.0293 *4*; α(L)=0.00335 *5*; α(M)=0.000520 *7* α(N)=4.25×10^{-5} *6*
		695.137 *9*	46.5 *20*	1330.872	4+	E2+M1	+1.7 *+6−1*	0.000999 *27*	B(M1)(W.u.)=0.00327 *+57−73*; B(E2)(W.u.)=26.3 *+46−31* α(K)=0.000889 *24*; α(L)=9.40×10^{-5} *26*; α(M)=1.46×10^{-5} *4* α(N)=1.240×10^{-6} *33* I_γ: high value of 79 *5* in (α,2nγ) is not used in averaging.
		809.828 *11*	100.0 *22*	1216.154	2+	E2		0.000706 *10*	B(E2)(W.u.)=35.5 *+51−40* α(K)=0.000629 *9*; α(L)=6.63×10^{-5} *9*; α(M)=1.031×10^{-5} *14* α(N)=8.76×10^{-7} *12*
		1466.8 *3*	3.1 *7*	559.103	2+	[E2]		0.000256 *4*	B(E2)(W.u.)=0.056 *+15−14* α(K)=0.0001626 *23*; α(L)=1.685×10^{-5} *24*; α(M)=2.62×10^{-6} *4* α(N)=2.241×10^{-7} *31*; α(IPF)=7.36×10^{-5} *10*
2127.224	(2)+	335.87 *10*	6.7 *7*	1791.437	0+				
		339.569 *5*	19.8 *19*	1787.655	2+				E_γ: from (n,γ) E=thermal. Others: 339.62 *10* from ^{76}Br ε+β^+ decay (16.14 h), 339.60 *10* from (n,n′γ),

$^{76}_{34}Se_{42}$-17

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
								and 338.0 15 from (p,p$'\gamma$). I_γ: unweighted average of 21 5 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), 16.1 16 from (n,γ) E=thermal, and 22.4 4 from (n,n$'\gamma$).
2127.224	(2)$^+$	438.253 5	44 6	1688.971	3$^+$			I_γ: unweighted average of 54.0 20 from ^{76}As β^- decay, 45 4 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), 26.8 29 from (n,γ) E=thermal, and 51.3 9 from (n,n$'\gamma$).
		796.10 6	1.49 33	1330.872	4$^+$			E_γ: weighted average of 796.44 26 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), 796.08 6 from (n,γ) E=thermal, and 796.2 3 from (p,p$'\gamma$). I_γ: from ^{76}Br $\varepsilon+\beta^+$ decay (16.14h). Other: 18.7 32 from (n,γ) E=thermal questionable.
		910.06 10	4.79 18	1216.154	2$^+$			E_γ: weighted average of 911.11 13 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 911.03 10 from (n,n$'\gamma$). Other: 910.7 8 from (p,p$'\gamma$). I_γ: weighted average of 4.73 14 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 5.3 4 from (n,n$'\gamma$).
		1005.01 16	4.8 14	1122.279	0$^+$			E_γ: weighted average of 1005.06 22 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 1004.98 16 from (n,n$'\gamma$). I_γ: unweighted average of 3.4 4 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 6.1 4 from (n,n$'\gamma$).
		1568.14 7	100.0 9	559.103	2$^+$			E_γ: weighted average of 1568.22 7 from ^{76}As β^- decay, 1568.25 10 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), 1568.02 7 from (n,γ) E=thermal, and 1568.07 12 from (n,n$'\gamma$). Other: 1568.1 5 from (p,p$'\gamma$). I_γ: from (n,n$'\gamma$). Others: 100.0 13 from ^{76}As β^- decay, 100 6 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), and 100 13 from (n,γ) E=thermal.
		2127.30 21	18.3 4	0.0	0$^+$			E_γ: unweighted average of 2127.0 1 from ^{76}As β^- decay, 2127.69 20 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), and 2127.21 8 from (n,n$'\gamma$). I_γ: weighted average of 18.0 13 from ^{76}As β^- decay, 16.7 14 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), and 18.4 4 from (n,n$'\gamma$).
2170.572	(0$^+$)	382.904 9	3.5 9	1787.655	2$^+$	[E2]	0.00647 9	α(K)=0.00574 8; α(L)=0.000629 9; α(M)=9.77×10^{-5} 14 α(N)=8.14×10^{-6} 11 B(E2)(W.u.)=70 +41−32 E_γ: from (n,γ) E=thermal. Other: 382.92 44 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h). I_γ: from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h).
		954.49 9	15.7 7	1216.154	2$^+$	[E2]	0.000470 7	α(K)=0.000418 6; α(L)=4.39×10^{-5} 6; α(M)=6.83×10^{-6} 10 α(N)=5.81×10^{-7} 8 B(E2)(W.u.)=3.3 +17−13 E_γ: weighted average of 954.7 2 from ^{76}As β^- decay, 954.35 28 from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), 954.47 9 from (n,n$'\gamma$), and 953.9 10 from (p,p$'\gamma$). I_γ: weighted average of 13.3 19 from ^{76}As β^- decay, 16.3 8 from ^{76}Br

From ENSDF

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									$\varepsilon+\beta^+$ decay (16.14 h), and 15.6 *7* from (n,n′γ). Other: 330 *120* in (n,γ) E=thermal indicates contamination.
2170.572	(0^+)	1611.65 *8*	100.0 *7*	559.103	2^+	[E2]		0.000282 *4*	α(K)=0.0001347 *19*; α(L)=1.394×10^{-5} *20*; α(M)=2.168×10^{-6} *30* α(N)=1.855×10^{-7} *26*; α(IPF)=0.0001310 *18* B(E2)(W.u.)=1.5 *+8−6* E_γ: weighted average of 1611.5 *3* from ^{76}As β^- decay, 1611.71 *12* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h), and 1611.63 *8* from (n,n′γ). Other: 1611.7 *5* from (p,p′γ). I_γ: (n,n′γ). Others: 100 *4* from ^{76}As β^- decay, ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h).
2262.42	6^+	931.50 *20*	100	1330.872	4^+	E2		0.000498 *7*	B(E2)(W.u.)=72.7 *+68−58* α(K)=0.000444 *6*; α(L)=4.66×10^{-5} *7*; α(M)=7.24×10^{-6} *10* α(N)=6.16×10^{-7} *9*
2362.963		575.305 *11*	100 *10*	1787.655	2^+				
		1032[b] *1*	<20	1330.872	4^+				
2429.131	3^-	301.96 *5*	0.67 *3*	2127.224	$(2)^+$	[E1]		0.00313 *4*	B(E1)(W.u.)=8.8×10^{-6} *14* α(K)=0.00279 *4*; α(L)=0.000292 *4*; α(M)=4.52×10^{-5} *6* α(N)=3.83×10^{-6} *5*
		403.094 *7*	1.83 *7*	2026.020	4^+	[E1]		1.44×10^{-3} *2*	B(E1)(W.u.)=1.01×10^{-5} *+16−15* α(K)=0.001280 *18*; α(L)=0.0001334 *19*; α(M)=2.072×10^{-5} *29* α(N)=1.759×10^{-6} *25*
		740.147 *20*	8.49 *18*	1688.971	3^+	(E1+M2)	−0.21 *12*	0.00040 *9*	B(E1)(W.u.)=7.2×10^{-6} *+11−12* α(K)=0.00036 *8*; α(L)=3.7×10^{-5} *8*; α(M)=5.8×10^{-6} *13* α(N)=5.0×10^{-7} *11* δ: from γγ(θ) in ^{76}As β^-. Other: +0.08 *16* from γ(θ) in ^{76}As β^-. Parity is from the Adopted Levels. B(M2)(W.u.)=2.7 *+47−23* exceeds RUL=1.
		1098.33 *5*	0.28 *5*	1330.872	4^+	[E1]		0.0001521 *21*	B(E1)(W.u.)=7.6×10^{-8} *18* α(K)=0.0001358 *19*; α(L)=1.400×10^{-5} *20*; α(M)=2.176×10^{-6} *30* α(N)=1.861×10^{-7} *26*

$^{76}_{34}Se_{42}$-19

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
2429.131	3^-	1212.980 *10*	100.0 *5*	1216.154	2^+	(E1+M2)	+0.025 *20*	0.0001820 *26*	B(E1)(W.u.)=2.02×10^{-5} *+32−29*; B(M2)(W.u.)=0.039 *+89−35* α(K)=0.0001136 *17*; α(L)=1.170×10^{-5} *17*; α(M)=1.818×10^{-6} *27* α(N)=1.556×10^{-7} *23*; α(IPF)=5.48×10^{-5} *8* δ: from $\gamma\gamma(\theta)$ in ^{76}As β^-. Others: −0.27 *13* from $\gamma(\theta)$ in (α,2nγ), +0.11 *10* from $\gamma(\theta)$ in ^{76}As β^-. Parity is the Adopted Levels.
		1870.02 *2*	3.87 *13*	559.103	2^+	(E1+M2)	+0.17 *3*	0.000589 *9*	B(E1)(W.u.)=2.07×10^{-7} *+33−31*; B(M2)(W.u.)=0.0079 *+32−28* α(K)=5.91×10^{-5} *16*; α(L)=6.06×10^{-6} *16*; α(M)=9.42×10^{-7} *25* α(N)=8.08×10^{-8} *22*; α(IPF)=0.000523 *9* δ: from $\gamma\gamma(\theta)$ in ^{76}As β^-. Other: +0.00 *8* from $\gamma(\theta)$ in ^{76}As β^-. Parity is from the Adopted Levels.
		2429.49 *22*	2.41 *4*	0.0	0^+	[E3]		0.000437 *6*	B(E3)(W.u.)=16.3 *+26−24* α(K)=9.90×10^{-5} *14*; α(L)=1.025×10^{-5} *14*; α(M)=1.596×10^{-6} *22* α(N)=1.367×10^{-7} *19*; α(IPF)=0.000326 *5*
2485.02	4^+	796.08 *6*	29.5 *7*	1688.971	3^+	M1+E2	+0.20 *+19−13*	0.000621 *14*	α(K)=0.000553 *13*; α(L)=5.76×10^{-5} *14*; α(M)=8.98×10^{-6} *22* α(N)=7.68×10^{-7} *18* B(M1)(W.u.)=0.0153 *+21−28*; B(E2)(W.u.)=1.3 *+32−11* E_γ,I_γ: from (n,n′γ) only. Mult.,δ: D+Q from $\gamma(\theta)$ in (n,n′γ); E1+M2 ruled out by RUL.
		1154.09 *9*	100 *1*	1330.872	4^+	M1+E2	−0.35 *5*	0.000289 *4*	α(K)=0.000255 *4*; α(L)=2.64×10^{-5} *4*; α(M)=4.11×10^{-6} *6* α(N)=3.52×10^{-7} *5*; α(IPF)=2.53×10^{-6} *4* B(M1)(W.u.)=0.0159 *23*; B(E2)(W.u.)=2.0 *6* E_γ,I_γ: from (n,n′γ) only. Mult.,δ: D+Q from $\gamma(\theta)$ in (n,n′γ); E1+M2 ruled out by RUL.
		1268.81 *9*	37.2 *8*	1216.154	2^+	[E2]		0.000268 *4*	α(K)=0.0002198 *31*; α(L)=2.286×10^{-5} *32*; α(M)=3.56×10^{-6} *5* α(N)=3.04×10^{-7} *4*; α(IPF)=2.098×10^{-5} *29* B(E2)(W.u.)=4.1 *6* E_γ,I_γ: from (n,n′γ) only.
2489.35	5^+	800.41 *9*	100.0 *6*	1688.971	3^+	E2		0.000728 *10*	B(E2)(W.u.)=67 *+19−17*

From ENSDF

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									α(K)=0.000648 *9*; α(L)=6.84×10^{-5} *10*; α(M)=1.063×10^{-5} *15* α(N)=9.03×10^{-7} *13* E_γ: weighted average of 800.6 *5* from (α,2nγ) and 800.40 *9* from (n,n′γ). I_γ: from (n,n′γ). Other: 100 *7* from (α,2nγ).
2489.35	5$^+$	1158.45 *5*	49.9 *6*	1330.872	4$^+$	E2+M1	+2.9 *8*	0.000302 *5*	B(M1)(W.u.)=5.6×10^{-4} *+46−23*; B(E2)(W.u.)=4.7 *13* α(K)=0.000266 *4*; α(L)=2.77×10^{-5} *4*; α(M)=4.31×10^{-6} *6* α(N)=3.68×10^{-7} *5*; α(IPF)=3.57×10^{-6} *9* E_γ: from (n,n′γ). Other: 1158.4 *5* from (α,2nγ). I_γ: from (n,n′γ). Other: 50.0 *33* from (α,2nγ).
2514.681	2$^+$	387.66 *49*	0.61 *12*	2127.224	(2)$^+$	[M1,E2]		0.0047 *15*	α(K)=0.0042 *14*; α(L)=4.5×10^{-4} *15*; α(M)=7.0×10^{-5} *24* α(N)=5.9×10^{-6} *19* B(M1)(W.u.)=0.00117 *+39−37* if M1, B(E2)(W.u.)=10.5 *+35−33* if E2.
		723.24 *11*	6.5 *12*	1791.437	0$^+$				
		727.014 *10*	100.0 *15*	1787.655	2$^+$	M1+E2	+0.22 *5*	0.000759 *11*	α(K)=0.000676 *10*; α(L)=7.06×10^{-5} *11*; α(M)=1.098×10^{-5} *17* α(N)=9.39×10^{-7} *14* B(M1)(W.u.)=0.028 *7*; B(E2)(W.u.)=3.4 *+18−16* δ: weighted average of +0.188 *52* from ^{76}Br ε decay and +0.24 *5* from (n,n′γ). Others: >+3.0 or <−0.10 from $\gamma(\theta)$ in ^{76}As β^- decay.
		825.78 *8*	3.0 *4*	1688.971	3$^+$	(M1+E2)		0.00062 *5*	α(K)=0.00055 *5*; α(L)=5.8×10^{-5} *5*; α(M)=9.0×10^{-6} *8* α(N)=7.7×10^{-7} *7* δ: −3 *+18−3* or −1 *+15−1* from (n,n′γ). B(M1)(W.u.)=6.0×10^{-4} *17* if M1, B(E2)(W.u.)=1.18 *33* if E2.
		1298.60 *12*	0.98 *5*	1216.154	2$^+$	[M1,E2]		0.000254 *9*	α(K)=0.000205 *5*; α(L)=2.12×10^{-5} *6*; α(M)=3.30×10^{-6} *9* α(N)=2.83×10^{-7} *8*; α(IPF)=2.43×10^{-5} *33* B(M1)(W.u.)=5.0×10^{-5} *13* if M1, B(E2)(W.u.)=0.040 *10* if E2.
		1392.36 *12*	2.1 *4*	1122.279	0$^+$	[E2]		0.0002534 *35*	α(K)=0.0001808 *25*; α(L)=1.877×10^{-5} *26*; α(M)=2.92×10^{-6} *4* α(N)=2.495×10^{-7} *35*; α(IPF)=5.07×10^{-5} *7* B(E2)(W.u.)=0.060 *19*
		1955.53 *4*	53.4 *12*	559.103	2$^+$	(M1+E2)	−0.21 *+5−6*	0.000348 *5*	α(K)=9.19×10^{-5} *13*; α(L)=9.45×10^{-6} *13*; α(M)=1.471×10^{-6} *21*

From ENSDF

$^{76}_{34}$Se$_{42}$-21

Adopted Levels, Gammas (continued)

$\gamma(^{76}$Se) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
									α(N)=1.262×10^{-7} *18*; α(IPF)=0.000245 *4* B(M1)(W.u.)=7.6×10^{-4} *19*; B(E2)(W.u.)=0.012 +*8*−*6* δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay.
2558.73		1342.30 *14*	100.0 *25*	1216.154	2$^+$				
		1999.74 *10*	31.3 *14*	559.103	2$^+$				
2604.09	1$^+$,2$^+$	816.47 *17*	6.2 *10*	1787.655	2$^+$	[M1,E2]		0.00064 *5*	α(K)=0.00057 *5*; α(L)=6.0×10^{-5} *5*; α(M)=9.3×10^{-6} *8* α(N)=7.9×10^{-7} *7* B(M1)(W.u.)=0.0017 +*7*−*6* if M1, B(E2)(W.u.)=3.4 +*15*−*13* if E2.
		1387.87 *6*	30.1 *10*	1216.154	2$^+$	[M1,E2]		0.000244 *10*	α(K)=0.000179 *4*; α(L)=1.85×10^{-5} *5*; α(M)=2.88×10^{-6} *7* α(N)=2.47×10^{-7} *6*; α(IPF)=4.4×10^{-5} *6* E_γ: weighted average of 1388.13 *27* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 1387.86 *6* from (n,n′γ). I_γ: weighted average of 28.6 *14* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 30.7 *9* from (n,n′γ). B(M1)(W.u.)=0.0017 +*7*−*6* if M1, B(E2)(W.u.)=1.17 +*46*−*40* if E2.
		2044.93 *6*	100.0 *9*	559.103	2$^+$	M1+E2	−3.0 +*14*−*60*	0.000423 *11*	α(K)=8.58×10^{-5} *12*; α(L)=8.84×10^{-6} *13*; α(M)=1.375×10^{-6} *20* α(N)=1.178×10^{-7} *17*; α(IPF)=0.000327 *10* B(M1)(W.u.)=1.7×10^{-4} +*35*−*14*; B(E2)(W.u.)=0.50 +*18*−*21* E_γ: from (n,n′γ). Other: 2045.49 *70* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h). I_γ: from (n,n′γ). Other: 100 *4* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h). Mult.,δ: D+Q from $\gamma\gamma(\theta)$ in ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h); E1+M2 ruled out by RUL.
		2604.10 *41*	0.91 *4*	0.0	0$^+$	[M1,E2]		0.00063 *4*	α(K)=5.57×10^{-5} *9*; α(L)=5.72×10^{-6} *9*; α(M)=8.90×10^{-7} *15* α(N)=7.64×10^{-8} *12*; α(IPF)=0.000567 *35* B(M1)(W.u.)=7.7×10^{-6} +*31*−*26* if M1, B(E2)(W.u.)=0.0015 +*6*−*5* if E2.
2617.89	(4)$^+$	830.41 *11*	26.8 *7*	1787.655	2$^+$	[E2]		0.000662 *9*	α(K)=0.000590 *8*; α(L)=6.21×10^{-5} *9*; α(M)=9.67×10^{-6} *14* α(N)=8.21×10^{-7} *11* B(E2)(W.u.)=31.1 *50*
		928.82 *14*	15.5 *5*	1688.971	3$^+$	M1+E2		0.000473 *30*	α(K)=0.000421 *26*; α(L)=4.40×10^{-5} *30*; α(M)=6.8×10^{-6} *5* α(N)=5.8×10^{-7} *4* δ: +8 +*21*−*5* or +0.15 *11* from (n,n′γ). B(M1)(W.u.)=0.0066 *11* if M1, B(E2)(W.u.)=10.3 *17* if E2.
		1286.91 *10*	100 *1*	1330.872	4$^+$	M1+E2	−0.22 *4*	0.0002480 *35*	α(K)=0.0002041 *29*; α(L)=2.111×10^{-5} *30*;

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
									α(M)=3.29×10^{-6} *5*
									α(N)=2.82×10^{-7} *4*; α(IPF)=1.918×10^{-5} *29*
									B(M1)(W.u.)=0.0152 *25*; B(E2)(W.u.)=0.60 *+24−21*
2617.89	(4)$^+$	1401.70 *11*	18.0 *7*	1216.154	2$^+$	[E2]		0.0002532 *35*	α(K)=0.0001784 *25*; α(L)=1.851×10^{-5} *26*; α(M)=2.88×10^{-6} *4* α(N)=2.461×10^{-7} *34*; α(IPF)=5.32×10^{-5} *7* B(E2)(W.u.)=1.53 *+24−26*
2655.383	1	484.69 *5*	1.33 *15*	2170.572	(0$^+$)				
		528.15 *6*	0.62 *3*	2127.224	(2)$^+$				
		863.90 *5*	1.79 *7*	1791.437	0$^+$				
		867.723 *26*	25 *3*	1787.655	2$^+$	D(+Q)	+0.013 *20*		δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay. Others: +0.08 *7* from $\gamma\gamma(\theta)$ in ^{76}As β^-, +0.4 *+6−3* from $\gamma(\theta)$ in ^{76}As β^-.
		1439.211 *21*	48.3 *8*	1216.154	2$^+$	D+Q	−0.043 *19*		δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay. Others: +0.01 *3*, +0.13 *9* from $\gamma\gamma(\theta)$ in ^{76}As β^-, −0.02 *10* from $\gamma(\theta)$ in ^{76}As β^-.
		1533.11 *5*	4.11 *8*	1122.279	0$^+$	D			δ: 0.0 from $\gamma(\theta)$ in ^{76}As β^-.
		2096.17 *3*	100.0 *8*	559.103	2$^+$	D(+Q)	−0.043 *+43−42*		δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay. Others: +0.02 *6* from $\gamma\gamma(\theta)$ in ^{76}As β^-, 0.00 *8* from $\gamma(\theta)$ in ^{76}As β^-.
		2655.47 *8*	7.3 *5*	0.0	0$^+$				
2669.904	2$^-$	882.213 *20*	18.2 *6*	1787.655	2$^+$	(E1)		0.0002325 *33*	α(K)=0.0002074 *29*; α(L)=2.144×10^{-5} *30*; α(M)=3.33×10^{-6} *5* α(N)=2.85×10^{-7} *4* B(E1)(W.u.)=6.7×10^{-5} *16* δ: +0.26 *15* from $\gamma\gamma(\theta)$ in ^{76}As β^- but it would give a large B(M2)(W.u.) exceeding RUL.
		980.80 *8*	13.0 *5*	1688.971	3$^+$	(E1)		0.0001885 *26*	B(E1)(W.u.)=3.5×10^{-5} *8* α(K)=0.0001683 *24*; α(L)=1.737×10^{-5} *24*; α(M)=2.70×10^{-6} *4* α(N)=2.307×10^{-7} *32* δ: <+0.24 or >+16.4 from $\gamma(\theta)$ in ^{76}As β^-.
		1453.717 *20*	35.4 *16*	1216.154	2$^+$	(E1+M2)	+0.045 *19*	0.000308 *4*	α(K)=8.34×10^{-5} *13*; α(L)=8.57×10^{-6} *13*; α(M)=1.333×10^{-6} *20* α(N)=1.141×10^{-7} *17*; α(IPF)=0.0002150 *30* B(E1)(W.u.)=2.9×10^{-5} *7*; B(M2)(W.u.)=0.13 *+13−9* δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay. Others: +0.05 *2* from $\gamma\gamma(\theta)$, −0.11 *12* from $\gamma(\theta)$ in ^{76}As β^-.

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
2669.904	2^-	2110.75 *5*	100.0 *7*	559.103	2^+	(E1+M2)	+0.047 *12*	0.000758 *11*	α(K)=4.64×10^{-5} *7*; α(L)=4.75×10^{-6} *7*; α(M)=7.39×10^{-7} *11* α(N)=6.34×10^{-8} *9*; α(IPF)=0.000706 *10* B(E1)(W.u.)=2.7×10^{-5} *6*; B(M2)(W.u.)=0.061 *+39−30* E_γ: from ^{76}As decay. Value of 2111.27 *8* from ^{76}Br decay fits poorly. Weighted average (NRM) of all available values is 2111.23 *12*. δ: from $\gamma\gamma(\theta)$ in ^{76}Br ε decay. Others: −0.09 *2* from $\gamma\gamma(\theta)$, −0.02 *16* from $\gamma(\theta)$ in ^{76}As β^-.
		2670.1 *5*	0.16 *7*	0.0	0^+	[M2]		0.000460 *6*	α(K)=8.79×10^{-5} *12*; α(L)=9.08×10^{-6} *13*; α(M)=1.413×10^{-6} *20* α(N)=1.213×10^{-7} *17*; α(IPF)=0.000362 *5* B(M2)(W.u.)=0.014 *+7−6*
2805.10	(4^+)	1474.21 *15*	100	1330.872	4^+				
2812.130	(3^+)	382.92 *17*	22.4 *9*	2429.131	3^-				
		1123.07 *10*	27.1 *11*	1688.971	3^+	(M1+E2)		0.000312 *12*	α(K)=0.000277 *11*; α(L)=2.88×10^{-5} *12*; α(M)=4.49×10^{-6} *18* α(N)=3.84×10^{-7} *15*; α(IPF)=1.29×10^{-6} *21* Mult.,δ: D+Q with δ=−1.61 *+30−21* or −0.045 *12* from (n,n′γ) are likely M1+E2.
		1481.48 *16*	9.6 *11*	1330.872	4^+				
		1595.93 *13*	100.0 *11*	1216.154	2^+	(M1(+E2))	+0.03 *3*	0.0002500 *35*	α(K)=0.0001341 *19*; α(L)=1.383×10^{-5} *19*; α(M)=2.152×10^{-6} *30* α(N)=1.847×10^{-7} *26*; α(IPF)=9.97×10^{-5} *14*
		2253.00 *18*	27.0 *12*	559.103	2^+	(M1+E2)		0.000485 *30*	α(K)=7.17×10^{-5} *11*; α(L)=7.37×10^{-6} *12*; α(M)=1.147×10^{-6} *18* α(N)=9.84×10^{-8} *16*; α(IPF)=0.000404 *30* δ: −1.0 *+14−2* or −4.8 *+10−3* from (n,n′γ).
2817.24	(2^+)	1486.67 *13*	1.3 *4*	1330.872	4^+	[E2]		0.000258 *4*	α(K)=0.0001582 *22*; α(L)=1.639×10^{-5} *23*; α(M)=2.55×10^{-6} *4* α(N)=2.181×10^{-7} *31*; α(IPF)=8.06×10^{-5} *11* B(E2)(W.u.)=0.33 *10*
		1600.92 *7*	100.0 *10*	1216.154	2^+	[M1,E2]		0.000265 *15*	α(K)=0.0001349 *25*; α(L)=1.394×10^{-5} *27*; α(M)=2.17×10^{-6} *4* α(N)=1.858×10^{-7} *34*; α(IPF)=0.000114 *13* B(M1)(W.u.)=0.0331 *21* if M1, B(E2)(W.u.)=17.4 *11* if E2.
		2258.04 *8*	63.9 *10*	559.103	2^+	[M1,E2]		0.000487 *30*	α(K)=7.14×10^{-5} *11*; α(L)=7.34×10^{-6} *12*; α(M)=1.142×10^{-6} *18*

$^{76}_{34}Se_{42}$-24

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^{π}_i	E_{γ}‡	I_{γ}‡	E_f	J^{π}_f	Mult.#	δ#	α†	Comments
									α(N)=9.80×10^{-8} *15*; α(IPF)=0.000407 *30* B(M1)(W.u.)=0.00752 *+50−45* if M1, B(E2)(W.u.)=1.99 *13* if E2.
2817.24	(2$^+$)	2817.20 *28*	0.61 *9*	0.0	0$^+$	[E2]		0.000753 *11*	α(K)=4.92×10^{-5} *7*; α(L)=5.05×10^{-6} *7*; α(M)=7.86×10^{-7} *11* α(N)=6.74×10^{-8} *9*; α(IPF)=0.000698 *10* B(E2)(W.u.)=0.0063 *10*
2824.797	5$^-$	335.5 *5*	5.8	2489.35	5$^+$	(E1)		2.34×10^{-3} *3*	B(E1)(W.u.)=4.2×10^{-5} *+15−14* α(K)=0.002089 *30*; α(L)=0.0002181 *32*; α(M)=3.39×10^{-5} *5* α(N)=2.87×10^{-6} *4* γ from (α,2nγ) only. δ(M2/E1)=+0.35 *15* gives B(M2)(W.u.)=210 *180*. RUL≤1 for M2 gives δ<0.01. Parity from the Adopted Levels.
		395.665 *5*	39 *3*	2429.131	3$^-$	E2		0.00581 *8*	B(E2)(W.u.)=87 *+27−23* α(K)=0.00515 *7*; α(L)=0.000563 *8*; α(M)=8.75×10^{-5} *12* α(N)=7.30×10^{-6} *10*
		562.3 *5*	<20	2262.42	6$^+$	[E1]		0.000625 *9*	B(E1)(W.u.)<4.2×10^{-5} α(K)=0.000557 *8*; α(L)=5.79×10^{-5} *8*; α(M)=9.00×10^{-6} *13* α(N)=7.67×10^{-7} *11*
		798.83 *6*	100 *8*	2026.020	4$^+$	(E1)		0.000285 *4*	B(E1)(W.u.)=5.4×10^{-5} *+16−14* α(K)=0.000254 *4*; α(L)=2.63×10^{-5} *4*; α(M)=4.09×10^{-6} *6* α(N)=3.49×10^{-7} *5* δ(Q/D)=+0.04 *4* from $\gamma(\theta)$ in (α,2nγ). Parities from the Adopted Levels give mult=E1.
		1493.88 *6*	65 *7*	1330.872	4$^+$	E1		0.000335 *5*	B(E1)(W.u.)=5.4×10^{-6} *+16−15* α(K)=7.93×10^{-5} *11*; α(L)=8.14×10^{-6} *11*; α(M)=1.266×10^{-6} *18* α(N)=1.084×10^{-7} *15*; α(IPF)=0.0002457 *34* δ: +0.03 *5* from $\gamma(\theta$,pol) in (α,2nγ).
2829.61	(1,2)	1041.18 *32*	100 *6*	1787.655	2$^+$				
		2829.99 *24*	0.54 *18*	0.0	0$^+$				
2859.781	4$^-$	430.649 *27*	71 *9*	2429.131	3$^-$	M1+E2	−0.7 *+4−12*	0.0031 *9*	B(M1)(W.u.)=0.053 *+41−32*; B(E2)(W.u.)=1.9×10^2 *+27−15* α(K)=0.0028 *8*; α(L)=2.9×10^{-4} *9*; α(M)=4.6×10^{-5} *14*

$^{76}_{34}Se_{42}$-25

$\gamma(^{76}$Se) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									α(N)=3.9×10^{-6} *11* B(E2)(W.u.)=1.9×10^{2} *+27−15* upper bound exceeds RUL=300.
2859.781	4^-	1170.85 *8*	35 *7*	1688.971	3^+	[E1]		0.0001659 *23*	α(K)=0.0001208 *17*; α(L)=1.244×10^{-5} *17*; α(M)=1.934×10^{-6} *27* α(N)=1.655×10^{-7} *23*; α(IPF)=3.06×10^{-5} *4* B(E1)(W.u.)=3.3×10^{-5} *+23−11*
		1528.87 *8*	100.0 *13*	1330.872	4^+	(E1(+M2))	<0.1	0.000359 *5*	B(E1)(W.u.)=4.3×10^{-5} *+37−15* α(K)=7.74×10^{-5} *15*; α(L)=7.95×10^{-6} *16*; α(M)=1.235×10^{-6} *24* α(N)=1.058×10^{-7} *21*; α(IPF)=0.000272 *4* δ: ≈0.4 for ΔJ=0 from $\gamma(\theta)$ in (α,2nγ) is too high. From RUL(M2)=1, δ<0.1. B(M2)(W.u.)<1.6 upper limit exceeds RUL=1.
2869.34	$(1^+,2^+)$	1653.06 *10*	51.7 *18*	1216.154	2^+	(M1+E2)		0.000277 *16*	α(K)=0.0001268 *22*; α(L)=1.310×10^{-5} *24*; α(M)=2.04×10^{-6} *4* α(N)=1.746×10^{-7} *31*; α(IPF)=0.000135 *14* δ: +0.38 *+14−12* or +1.1 *+3−8* from (n,n′γ). B(M1)(W.u.)=1.76×10^{-5} *+15−13* if M1, B(E2)(W.u.)=0.0086 *7* if E2.
		2310.09 *16*	100.0 *11*	559.103	2^+	(M1+E2)		0.000508 *31*	α(K)=6.86×10^{-5} *11*; α(L)=7.05×10^{-6} *11*; α(M)=1.097×10^{-6} *18* α(N)=9.41×10^{-8} *15*; α(IPF)=0.000431 *31* δ: −0.52 *9* or −12 *+52−6* from (n,n′γ). B(M1)(W.u.)=1.25×10^{-5} *10* if M1, B(E2)(W.u.)=0.00314 *+25−22* if E2.
		2869.40 *31*	23.1 *15*	0.0	0^+				
2910.993	(1 to 4)	548.028[b] *12*	100	2362.963					
2917.32	$(4)^+$	1586.41 *8*	100	1330.872	4^+	(M1+E2)	+0.34 *4*	0.000251 *4*	α(K)=0.0001360 *19*; α(L)=1.403×10^{-5} *20*; α(M)=2.183×10^{-6} *31* α(N)=1.873×10^{-7} *26*; α(IPF)=9.87×10^{-5} *15*
2950.171	1^+	294.60 *17*	0.108 *24*	2655.383	1				
		779.48 *10*	0.287 *28*	2170.572	(0^+)	[M1]		0.000645 *9*	α(K)=0.000575 *8*; α(L)=5.99×10^{-5} *8*; α(M)=9.32×10^{-6} *13* α(N)=7.98×10^{-7} *11* B(M1)(W.u.)=9.0×10^{-4} *+19−15*
		822.92 *31*	0.26 *5*	2127.224	$(2)^+$	[M1,E2]		0.00063 *5*	α(K)=0.00056 *5*; α(L)=5.8×10^{-5} *5*; α(M)=9.1×10^{-6} *8* α(N)=7.7×10^{-7} *7*

$^{76}_{34}$Se$_{42}$-26

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									B(M1)(W.u.)=7.0×10^{-4} *+20−16* if M1, B(E2)(W.u.)=1.38 *+39−31* if E2.
2950.171	1$^+$	1158.68 *13*	1.64 *20*	1791.437	0$^+$	[M1]		0.000284 *4*	α(K)=0.0002512 *35*; α(L)=2.60×10^{-5} *4*; α(M)=4.05×10^{-6} *6* α(N)=3.47×10^{-7} *5*; α(IPF)=2.70×10^{-6} *4* B(M1)(W.u.)=0.00157 *+35−28*
		1733.96 *19*	0.34 *5*	1216.154	2$^+$	[M1,E2]		0.000298 *18*	α(K)=0.0001158 *20*; α(L)=1.195×10^{-5} *21*; α(M)=1.859×10^{-6} *33* α(N)=1.593×10^{-7} *27*; α(IPF)=0.000168 *17* B(M1)(W.u.)=9.7×10^{-5} *+24−19* if M1, B(E2)(W.u.)=0.044 *+11−8* if E2.
		1828.22 *39*	0.59 *18*	1122.279	0$^+$	[M1]		0.000305 *4*	α(K)=0.0001039 *15*; α(L)=1.070×10^{-5} *15*; α(M)=1.665×10^{-6} *23* α(N)=1.429×10^{-7} *20*; α(IPF)=0.0001888 *26* B(M1)(W.u.)=1.4×10^{-4} *5*
		2391.14 *30*	57.2 *14*	559.103	2$^+$	M1+E2	−0.058 *+4−5*	0.000509 *7*	B(M1)(W.u.)=0.0062 *+12−9*; B(E2)(W.u.)=0.0049 *+14−9* α(K)=6.41×10^{-5} *9*; α(L)=6.58×10^{-6} *9*; α(M)=1.024×10^{-6} *14* α(N)=8.79×10^{-8} *12*; α(IPF)=0.000437 *6* Mult.: M1,E2 from α(K)exp and D+Q from γγ(θ) in ^{76}Br ε decay.
		2950.49 *9*	100.0 *13*	0.0	0$^+$	(M1)		0.000731 *10*	B(M1)(W.u.)=0.0058 *+11−8* α(K)=4.47×10^{-5} *6*; α(L)=4.58×10^{-6} *6*; α(M)=7.13×10^{-7} *10* α(N)=6.12×10^{-8} *9*; α(IPF)=0.000681 *10* Mult.: from α(K)exp in ^{76}Br ε; γ(θ) in (γ,γ′).
2969.48	2$^-$,3$^-$,4$^-$	540.40 *8*	48.2 *13*	2429.131	3$^-$	(M1+E2)		0.0018 *4*	α(K)=0.00161 *32*; α(L)=0.00017 *4*; α(M)=2.7×10^{-5} *6* α(N)=2.3×10^{-6} *5* δ: −0.44 *12* or −1.7 *4* from (n,n′γ).
		1280.44 *10*	100.0 *13*	1688.971	3$^+$				
2975.00	(2$^+$,3,4$^+$)	847.51 *11*	16.6 *16*	2127.224	(2)$^+$				
		1286.04 *11*	100 *10*	1688.971	3$^+$				
		1644.28 *12*	9.1 *10*	1330.872	4$^+$				
		1758.90 *12*	6.8 *7*	1216.154	2$^+$				
		2415.96 *34*	9.9 *10*	559.103	2$^+$				
2975.98	6$^+$	713.8 *5*	9.5	2262.42	6$^+$	[M1+E2]		0.00088 *10*	α(K)=0.00079 *9*; α(L)=8.3×10^{-5} *10*; α(M)=1.29×10^{-5} *16*

$^{76}_{34}Se_{42}$-27

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									α(N)=1.09×10^{-6} *13* B(M1)(W.u.)=0.0044 *+24−18* if M1, B(E2)(W.u.)=12 *+7−5* if E2.
2975.98	6$^+$	950.0 *5*	100 *7*	2026.020	4$^+$	E2		0.000475 *7*	B(E2)(W.u.)=29 *+15−11* α(K)=0.000423 *6*; α(L)=4.44×10^{-5} *6*; α(M)=6.91×10^{-6} *10* α(N)=5.88×10^{-7} *8*
3007.75	(2)$^+$	1791.52 *12*	10.3 *6*	1216.154	2$^+$	(M1+E2)		0.000314 *20*	α(K)=0.0001089 *18*; α(L)=1.123×10^{-5} *19*; α(M)=1.747×10^{-6} *30* α(N)=1.497×10^{-7} *25*; α(IPF)=0.000192 *19* δ: +5 *+58−2* or −0.21 *19* from (n,n′γ). B(M1)(W.u.)=0.0127 *12* if M1, B(E2)(W.u.)=5.3 *5* if E2.
		2448.74 *12*	100.0 *8*	559.103	2$^+$	M1+E2	−0.16 *5*	0.000533 *8*	α(K)=6.15×10^{-5} *9*; α(L)=6.31×10^{-6} *9*; α(M)=9.82×10^{-7} *14* α(N)=8.43×10^{-8} *12*; α(IPF)=0.000464 *7* B(M1)(W.u.)=0.0470 *+38−36*; B(E2)(W.u.)=0.27 *+19−14*
		3007.40 *20*	5.0 *8*	0.0	0$^+$	[E2]		0.000832 *12*	α(K)=4.42×10^{-5} *6*; α(L)=4.53×10^{-6} *6*; α(M)=7.05×10^{-7} *10* α(N)=6.05×10^{-8} *8*; α(IPF)=0.000782 *11* B(E2)(W.u.)=0.194 *33*
3031.57	0$^+$	1815.40 *8*	60.5 *19*	1216.154	2$^+$	[E2]		0.000342 *5*	α(K)=0.0001072 *15*; α(L)=1.106×10^{-5} *15*; α(M)=1.721×10^{-6} *24* α(N)=1.473×10^{-7} *21*; α(IPF)=0.0002217 *31* B(E2)(W.u.)=5.8 *+6−5*
		2472.39 *12*	100.0 *19*	559.103	2$^+$	[E2]		0.000608 *9*	α(K)=6.14×10^{-5} *9*; α(L)=6.31×10^{-6} *9*; α(M)=9.82×10^{-7} *14* α(N)=8.42×10^{-8} *12*; α(IPF)=0.000539 *8* B(E2)(W.u.)=2.04 *+19−16*
3045.79	(5$^-$)	221.21 *11*	100 *6*	2824.797	5$^-$	(M1)		0.0125 *2*	B(M1)(W.u.)=2.8 *+13−11* α(K)=0.01111 *16*; α(L)=0.001191 *17*; α(M)=0.0001856 *26* α(N)=1.578×10^{-5} *22* Mult.,δ: $\gamma(\theta)$ in (α,2nγ) consistent with ΔJ=0 or 2; δ(Q/D)=+0.6 *3* from $\gamma(\theta)$ in (α,2nγ) (1984Zo01) would require a B(E2)(W.u.)=2.0×10^4 *+17−15* exceeding RUL=300; POL from (α,2nγ) seems consistent with E1 but it would require a B(E1)(W.u.)=0.048 *15-34* exceeding RUL=0.01. B(M1)(W.u.)=2.0 *+10−9* upper bound exceeds RUL=3.
		1714.73 *10*	87 *6*	1330.872	4$^+$	[E1]		0.000491 *7*	B(E1)(W.u.)=8.8×10^{-5} *+40−33* α(K)=6.35×10^{-5} *9*; α(L)=6.51×10^{-6} *9*; α(M)=1.012×10^{-6} *14* α(N)=8.67×10^{-8} *12*; α(IPF)=0.000420 *6*
3069.62	2$^+$	257.63 *12*	0.056 *9*	2812.130	(3$^+$)				

$^{76}_{34}Se_{42}$-28

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
3069.62	2+	399.59 *52*	1.77 *11*	2669.904	2−	[E1]		1.47×10−3 *2*	α(K)=0.001310 *19*; α(L)=0.0001365 *20*; α(M)=2.120×10−5 *31* α(N)=1.800×10−6 *26* B(E1)(W.u.)=1.64×10−4 *28*
		414.14 *10*	0.093 *7*	2655.383	1				
		640.46 *31*	0.151 *27*	2429.131	3−	[M2]		0.00281 *4*	α(K)=0.002498 *35*; α(L)=0.000269 *4*; α(M)=4.20×10−5 *6* α(N)=3.58×10−6 *5* B(M2)(W.u.)=38 +*10*−*9* exceeds RUL=1.
		942.21 *12*	4.1 *26*	2127.224	(2)+	(M1(+E2))	+0.04 *5*	0.000431 *6*	α(K)=0.000384 *5*; α(L)=3.99×10−5 *6*; α(M)=6.21×10−6 *9* α(N)=5.32×10−7 *7* B(M1)(W.u.)=0.0017 +*16*−*12*; B(E2)(W.u.)<0.04
		1380.52 *9*	20.6 *28*	1688.971	3+	(M1+E2)		0.000245 *10*	α(K)=0.000181 *4*; α(L)=1.87×10−5 *5*; α(M)=2.91×10−6 *7* α(N)=2.49×10−7 *6*; α(IPF)=4.2×10−5 *5* δ: +0.04 *9* or −7 +*14*−*3* from (n,n′γ). B(M1)(W.u.)=0.0027 *5* if M1, B(E2)(W.u.)=1.91 *37* if E2.
		1853.24 *20*	100.0 *9*	1216.154	2+	M1+E2	+0.035 *4*	0.000313 *4*	α(K)=0.0001013 *14*; α(L)=1.043×10−5 *15*; α(M)=1.624×10−6 *23* α(N)=1.393×10−7 *20*; α(IPF)=0.0001993 *28* B(M1)(W.u.)=0.0054 *9*; B(E2)(W.u.)=0.0026 +*8*−*7*
		2510.68 *19*	12.7 *16*	559.103	2+	(M1+E2)	+0.069 *6*	0.000557 *8*	α(K)=5.88×10−5 *8*; α(L)=6.04×10−6 *8*; α(M)=9.40×10−7 *13* α(N)=8.07×10−8 *11*; α(IPF)=0.000491 *7* B(M1)(W.u.)=2.8×10−4 *5*; B(E2)(W.u.)=2.8×10−4 +*8*−*7*
		3070.08 *20*	0.065 *4*	0.0	0+	[E2]		0.000857 *12*	α(K)=4.27×10−5 *6*; α(L)=4.38×10−6 *6*; α(M)=6.81×10−7 *10* α(N)=5.85×10−8 *8*; α(IPF)=0.000809 *11* B(E2)(W.u.)=1.10×10−4 *19*
3084.58	(1+,2+,3+)	2525.43 *6*	100	559.103	2+				
3105.48	(3−)	1774.58 *23*	33.8 *23*	1330.872	4+	[E1]		0.000532 *7*	α(K)=6.01×10−5 *8*; α(L)=6.17×10−6 *9*; α(M)=9.59×10−7 *13* α(N)=8.21×10−8 *12*; α(IPF)=0.000465 *7* B(E1)(W.u.)=6.8×10−5 +*10*−*8*

$\gamma(^{76}$Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
3105.48	(3−)	1889.2 6	31 9	1216.154	2+	[E1]		0.000610 9	α(K)=5.46×10^{-5} 8; α(L)=5.59×10^{-6} 8; α(M)=8.70×10^{-7} 12 α(N)=7.46×10^{-8} 10; α(IPF)=0.000549 8 B(E1)(W.u.)=5.2×10^{-5} 14
		2546.6 4	100.0 12	559.103	2+	[E1]		1.03×10^{-3} 1	α(K)=3.53×10^{-5} 5; α(L)=3.61×10^{-6} 5; α(M)=5.61×10^{-7} 8 α(N)=4.81×10^{-8} 7; α(IPF)=0.000986 14 B(E1)(W.u.)=6.9×10^{-5} +9−7
3160.115	(2+)	209.92 10	1.86 9	2950.171	1+	[M1,E2]		0.034 20	α(K)=0.030 17; α(L)=0.0034 20; α(M)=5.3×10^{-4} 32 α(N)=4.3×10^{-5} 25 B(M1)(W.u.)=0.048 +18−16 if M1. B(E2)(W.u.)=1.5×10^{3} +6−5 exceeds RUL=300 if E2.
		290.79 35	0.171 18	2869.34	(1+,2+)				
		347.88 10	1.32 18	2812.130	(3+)				
		489.98 13	12.9 8	2669.904	2−	[E1]		0.000873 12	α(K)=0.000779 11; α(L)=8.10×10^{-5} 11; α(M)=1.259×10^{-5} 18 α(N)=1.071×10^{-6} 15 B(E1)(W.u.)=4.5×10^{-4} +17−15
		504.54 10	10.7 25	2655.383	1	[E1]		0.000812 11	α(K)=0.000724 10; α(L)=7.53×10^{-5} 11; α(M)=1.171×10^{-5} 16 α(N)=9.96×10^{-7} 14 B(E1)(W.u.)=3.4×10^{-4} +15−14
		730.71 11	20.8 17	2429.131	3−	[E1]		0.000345 5	α(K)=0.000307 4; α(L)=3.19×10^{-5} 4; α(M)=4.95×10^{-6} 7 α(N)=4.23×10^{-7} 6 B(E1)(W.u.)=2.2×10^{-4} +8−7
		1032.58 10	25 5	2127.224	(2)+	[M1,E2]		0.000373 18	α(K)=0.000333 16; α(L)=3.47×10^{-5} 18; α(M)=5.39×10^{-6} 28 α(N)=4.61×10^{-7} 22 B(M1)(W.u.)=0.0055 +22−20 if M1, B(E2)(W.u.)=6.9 +27−25 if E2.
		1372.29 13	24.2 22	1787.655	2+	[M1,E2]		0.000245 10	α(K)=0.000183 4; α(L)=1.89×10^{-5} 5; α(M)=2.95×10^{-6} 7 α(N)=2.52×10^{-7} 6; α(IPF)=4.0×10^{-5} 5 B(M1)(W.u.)=0.0023 +9−8 if M1, B(E2)(W.u.)=1.6 +6−5 if E2.
		1471.08 7	100.0 18	1688.971	3+	[M1,E2]		0.000245 11	α(K)=0.0001592 33; α(L)=1.65×10^{-5} 4; α(M)=2.56×10^{-6} 6 α(N)=2.19×10^{-7} 5; α(IPF)=6.7×10^{-5} 8

$^{76}_{34}$Se$_{42}$-30

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									B(M1)(W.u.)=0.0075 +*27*−*24* if M1, B(E2)(W.u.)=4.7 +*17*−*15* if E2.
3160.115	(2^+)	1830.80 *15*	0.72 *6*	1330.872	4^+	[E2]		0.000347 *5*	α(K)=0.0001055 *15*; α(L)=1.088×10^{-5} *15*; α(M)=1.693×10^{-6} *24* α(N)=1.450×10^{-7} *20*; α(IPF)=0.0002289 *32* B(E2)(W.u.)=0.0113 +*42*−*37*
		1944.18 *10*	17.0 *7*	1216.154	2^+	(M1(+E2))	+0.05 *6*	0.000342 *5*	α(K)=9.28×10^{-5} *13*; α(L)=9.55×10^{-6} *13*; α(M)=1.486×10^{-6} *21* α(N)=1.275×10^{-7} *18*; α(IPF)=0.0002384 *34* B(M1)(W.u.)=5.5×10^{-4} +*28*−*24*; B(E2)(W.u.)<0.0036
		2601.36 *20*	26.8 *11*	559.103	2^+	(M1+E2)	+0.149 *22*	0.000595 *8*	α(K)=5.54×10^{-5} *8*; α(L)=5.68×10^{-6} *8*; α(M)=8.84×10^{-7} *12* α(N)=7.59×10^{-8} *11*; α(IPF)=0.000533 *7* B(M1)(W.u.)=3.6×10^{-4} +*13*−*12*; B(E2)(W.u.)=0.0016 +*8*−*7* This γ is placed in (n,n′γ) from a different level with $J^\pi=0^+$.
3161.80	(3^-)	732.77 *6*	47.3 *31*	2429.131	3^-	(M1+E2)	+0.2 +*14*−*1*	0.00074 *12*	α(K)=0.00066 *11*; α(L)=6.9×10^{-5} *12*; α(M)=1.08×10^{-5} *19* α(N)=9.2×10^{-7} *15* B(M1)(W.u.)=0.045 +*8*−*13*; B(E2)(W.u.)=5 +*14*−*4*
		1830.79 *8*	60.2 *21*	1330.872	4^+	[E1]		0.000570 *8*	α(K)=5.73×10^{-5} *8*; α(L)=5.87×10^{-6} *8*; α(M)=9.13×10^{-7} *13* α(N)=7.83×10^{-8} *11*; α(IPF)=0.000506 *7* B(E1)(W.u.)=6.5×10^{-5} *13*
		1945.48 *10*	100.0 *29*	1216.154	2^+	[E1]		0.000649 *9*	α(K)=5.22×10^{-5} *7*; α(L)=5.35×10^{-6} *7*; α(M)=8.32×10^{-7} *12* α(N)=7.13×10^{-8} *10*; α(IPF)=0.000590 *8* B(E1)(W.u.)=9.1×10^{-5} *17*
3191.67	$(3)^+$	1502.74 *20*	100.0 *32*	1688.971	3^+	(M1+E2)		0.000249 *12*	α(K)=0.0001526 *30*; α(L)=1.578×10^{-5} *34*; α(M)=2.46×10^{-6} *5* α(N)=2.10×10^{-7} *4*; α(IPF)=7.7×10^{-5} *9* δ: +1.93 +*28*−*34* or −0.14 *5* from (n,n′γ). B(M1)(W.u.)=0.0392 +*36*−*32* if M1, B(E2)(W.u.)=23.3 +*22*−*19* if E2.
		1860.91 *26*	17 *6*	1330.872	4^+	(M1+E2)	−0.2 +*88*−*1*	0.00032 *4*	α(K)=0.0001006 *22*; α(L)=1.036×10^{-5} *24*; α(M)=1.61×10^{-6} *4* α(N)=1.383×10^{-7} *29*; α(IPF)=0.00020 *4* B(M1)(W.u.)<0.0052; B(E2)(W.u.)<2.0
		1975.6 *6*	17.5 *10*	1216.154	2^+	(M1+E2)		0.000377 *24*	α(K)=9.08×10^{-5} *15*; α(L)=9.35×10^{-6} *15*;

$^{76}_{34}Se_{42}$-31

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									α(M)=1.455×10^{-6} 24 α(N)=1.248×10^{-7} 20; α(IPF)=0.000275 23 δ: −0.02 9 or −4.6 +33−14 from (n,n′γ). B(M1)(W.u.)=0.00302 +33−29 if M1, B(E2)(W.u.)=1.04 +11−10 if E2.
3191.67	(3)$^+$	2632.9 5	13.4 34	559.103	2$^+$	(M1+E2)		0.00064 4	α(K)=5.47×10^{-5} 9; α(L)=5.61×10^{-6} 9; α(M)=8.73×10^{-7} 14 α(N)=7.49×10^{-8} 12; α(IPF)=0.00058 4 δ: +0.26 10 or +14 +50−8 from (n,n′γ). B(M1)(W.u.)=9.8×10^{-4} 24 if M1, B(E2)(W.u.)=0.189 +48−46 if E2.
3212.98	1$^+$,2$^+$	2653.82 10	100.0 4	559.103	2$^+$	M1+E2		0.00065 4	α(K)=5.39×10^{-5} 9; α(L)=5.54×10^{-6} 9; α(M)=8.61×10^{-7} 14 α(N)=7.39×10^{-8} 12; α(IPF)=0.00059 4 δ: +3.2 +7−4 or −0.10 5 from (n,n′γ). B(M1)(W.u.)=0.098 +15−11 if M1, B(E2)(W.u.)=18.6 +28−21 if E2.
		3214.7 20	8.6 4	0.0	0$^+$	[M1,E2]		0.00087 4	α(K)=3.92×10^{-5} 7; α(L)=4.02×10^{-6} 7; α(M)=6.25×10^{-7} 11 α(N)=5.37×10^{-8} 10; α(IPF)=0.00083 4 B(M1)(W.u.)=0.0047 +7−6 if M1, B(E2)(W.u.)=0.62 +9−7 if E2.
3219.428	(2$^+$,3$^+$)	790.12 4	38 12	2429.131	3$^-$	[E1]		0.000292 4	α(K)=0.000260 4; α(L)=2.69×10^{-5} 4; α(M)=4.19×10^{-6} 6 α(N)=3.57×10^{-7} 5 B(E1)(W.u.)=0.0033 +8−9
		1530.32 43	1.57 27	1688.971	3$^+$	[M1,E2]		0.000252 13	α(K)=0.0001473 29; α(L)=1.523×10^{-5} 32; α(M)=2.37×10^{-6} 5 α(N)=2.03×10^{-7} 4; α(IPF)=8.7×10^{-5} 10 B(M1)(W.u.)=0.00110 +23−21 if M1, B(E2)(W.u.)=0.63 +13−12 if E2.
		1888.95 36	17.4 10	1330.872	4$^+$	[M1,E2]		0.000346 22	α(K)=9.86×10^{-5} 16; α(L)=1.017×10^{-5} 17; α(M)=1.581×10^{-6} 26 α(N)=1.356×10^{-7} 22; α(IPF)=0.000235 21 B(M1)(W.u.)=0.0065 +8−7 if M1, B(E2)(W.u.)=2.43 +31−27 if E2.
		2660.38 11	100.0 12	559.103	2$^+$	[M1,E2]		0.00065 4	α(K)=5.37×10^{-5} 9; α(L)=5.51×10^{-6} 9; α(M)=8.58×10^{-7} 14 α(N)=7.36×10^{-8} 12; α(IPF)=0.00059 4 B(M1)(W.u.)=0.0133 +16−13 if M1, B(E2)(W.u.)=2.52 +29−25 if E2.
3225.7	(6,8$^+$)	963.3 5	100	2262.42	6$^+$				Mult.: $\gamma(\theta)$ in (α,2nγ) consistent with ΔJ=0 or 2.
3230.27	1,2$^+$	1059.69 8	100	2170.572	(0$^+$)	[D,E2]			B(E2)(W.u.)=32 +25−16 if E2.
3238.78		413.98 8	100	2824.797	5$^-$				
3259.81		309.77 12	46.2 21	2950.171	1$^+$				
		604.33 10	100 5	2655.383	1				
3262.34	6$^-$	402.7 5	27.3 23	2859.781	4$^-$	(E2)		0.00548 8	B(E2)(W.u.)=38 +32−13

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
									α(K)=0.00486 *7*; α(L)=0.000531 *8*; α(M)=8.25×10^{-5} *12* α(N)=6.88×10^{-6} *10*
3262.34	6$^-$	437.6 *5*	100 *7*	2824.797	5$^-$	M1+E2	−0.25 *5*	0.00247 *6*	B(M1)(W.u.)=0.012 +*11*−*4*; B(E2)(W.u.)=5 +*5*−*3* α(K)=0.00220 *5*; α(L)=0.000232 *5*; α(M)=3.62×10^{-5} *8* α(N)=3.08×10^{-6} *7* δ=−0.25 *5* from (α,2nγ). RUL (for E2 and M2) favors M1+E2.
		999.9 *5*	40.9 *23*	2262.42	6$^+$	(E1+M2)	−0.23 *17*	2.2×10^{-4} *6*	B(E1)(W.u.)=7×10^{-6} +*6*−*3* α(K)=1.9×10^{-4} *5*; α(L)=2.0×10^{-5} *6*; α(M)=3.1×10^{-6} *9* α(N)=2.7×10^{-7} *8* B(M2)(W.u.)=1.8 +*42*−*15* exceeds RUL=1.
3262.96		1135.73 *8*	100	2127.224	(2)$^+$				
3267.57	(2$^+$,3,4$^+$)	1578.45 *16*	15 *8*	1688.971	3$^+$				
		1936.54 *24*	100.0 *22*	1330.872	4$^+$				
		2051.3 *5*	42 *6*	1216.154	2$^+$				
		2708.8 *5*	84.2 *22*	559.103	2$^+$				
3268.70	(1$^-$,2)	163.35 *11*	2.81 *21*	3105.48	(3$^-$)				
		318.74 *10*	15.0 *7*	2950.171	1$^+$				
		456.75 *16*	2.8 *4*	2812.130	(3$^+$)				
		598.78 *10*	100 *7*	2669.904	2$^-$				
		613.35 *10*	11.9 *6*	2655.383	1				
		1141.62 *14*	3.15 *27*	2127.224	(2)$^+$				
3269.75	8$^+$	1007.2 *5*	100	2262.42	6$^+$	E2		0.000414 *6*	B(E2)(W.u.)=82 +*21*−*14* α(K)=0.000368 *5*; α(L)=3.86×10^{-5} *5*; α(M)=6.00×10^{-6} *8* α(N)=5.11×10^{-7} *7*
3282.19	1,2$^+$	464.67 *20*	50.6 *14*	2817.24	(2$^+$)				
		2160.00 *13*	100.0 *14*	1122.279	0$^+$	[D,E2]			B(E2)(W.u.)=4.14 +*40*−*36* if E2.
3295.02	(1$^+$,2$^+$)	1124.33 *13*	11.2 *8*	2170.572	(0$^+$)				
		2736.6 *4*	100.0 *19*	559.103	2$^+$				E_γ: unweighted average of 2737.07 *24* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h) and 2736.21 *10* from (n,n′γ). I_γ: from (n,n′γ). Other: 100 *6* from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h).
		3295.6 *6*	42.6 *34*	0.0	0$^+$	[M1,E2]		0.00090 *4*	α(K)=3.77×10^{-5} *7*; α(L)=3.86×10^{-6} *7*; α(M)=6.00×10^{-7} *11* α(N)=5.15×10^{-8} *9*; α(IPF)=0.00086 *4*

$^{76}_{34}Se_{42}$-33

Adopted Levels, Gammas (continued)

$\gamma(^{76}$Se) (continued)

E_i(level)	J^{π}_i	E_{γ}[‡]	I_{γ}[‡]	E_f	J^{π}_f	Mult.[#]	δ[#]	α[†]	Comments
									E_{γ}: unweighted average of 3296.14 *20* from ^{76}Br ε+β^+ decay (16.14 h) and 3295.07 *14* from (n,n′γ). I_{γ}: unweighted average of 45.9 *17* from ^{76}Br ε+β^+ decay (16.14 h) and 39.2 *14* from (n,n′γ).
3296.2	(1$^+$,2$^+$)	1508.4 *9*	80 *41*	1787.655	2$^+$				E_{γ}: unweighted average of 1509.23 *16* from ^{76}Br ε+β^+ decay (16.14 h) and 1507.52 *14* from (n,n′γ). I_{γ}: from ^{76}Br ε+β^+ decay.
		2173.9 *8*	100 *7*	1122.279	0$^+$				E_{γ}: unweighted average of 2174.66 *30* from ^{76}Br ε+β^+ decay (16.14 h) and 2173.06 *18* from (n,n′γ). I_{γ}: from ^{76}Br ε+β^+ decay.
3312.04	(6$^-$)	266.1 *5*	100 *8*	3045.79	(5$^-$)	(M1+E2)		0.015 *7*	α(K)=0.014 *7*; α(L)=0.0015 *8*; α(M)=2.3×10^{-4} *12* α(N)=1.9×10^{-5} *9* B(M1)(W.u.)=0.0045 *+45−22* if M1, B(E2)(W.u.)=9×10^1 *+9−4* if E2.
		487.1 *5*	85 *8*	2824.797	5$^-$	(M1+E2)	+0.25 *5*	0.00191 *4*	B(M1)(W.u.)=6×10^{-4} *+6−3*; B(E2)(W.u.)=0.21 *+23−11* α(K)=0.001700 *34*; α(L)=0.000179 *4*; α(M)=2.79×10^{-5} *6* α(N)=2.38×10^{-6} *5*
3331.51		2772.35 *8*	100	559.103	2$^+$				
3346.25		1320.57 *18*	100.0 *35*	2026.020	4$^+$				
		2015.13 *14*	73.3 *35*	1330.872	4$^+$				
3348.48	(1$^+$,2$^+$)	1177.90 *11*	100	2170.572	(0$^+$)	[M1,E2]		0.000286 *10*	α(K)=0.000251 *8*; α(L)=2.60×10^{-5} *10*; α(M)=4.05×10^{-6} *15* α(N)=3.47×10^{-7} *12*; α(IPF)=4.8×10^{-6} *7* B(M1)(W.u.)=0.05 *+10−3* if M1, B(E2)(W.u.)=4×10^1 *+9−3* if E2.
3351.462	(2)$^+$	191.44 *30*	0.42 *33*	3160.115	(2$^+$)				
		401.30 *11*	0.58 *4*	2950.171	1$^+$	[M1,E2]		0.0042 *13*	α(K)=0.0037 *12*; α(L)=4.0×10^{-4} *13*; α(M)=6.3×10^{-5} *21* α(N)=5.3×10^{-6} *17* B(M1)(W.u.)=0.0134 *+18−15* if M1, B(E2)(W.u.)=112 *+15−13* if E2.
		539.25 *14*	0.148 *13*	2812.130	(3$^+$)				
		681.44 *10*	7.8 *4*	2669.904	2$^-$	[E1]		0.000402 *6*	α(K)=0.000358 *5*; α(L)=3.72×10^{-5} *5*; α(M)=5.78×10^{-6} *8* α(N)=4.93×10^{-7} *7* B(E1)(W.u.)=6.3×10^{-4} *+8−7*
		695.95 *10*	9.1 *5*	2655.383	1				
		747.28 *13*	1.48 *11*	2604.09	1$^+$,2$^+$				
		836.62 *10*	6.30 *31*	2514.681	2$^+$	[M1,E2]		0.00060 *5*	α(K)=0.00054 *4*; α(L)=5.6×10^{-5} *5*; α(M)=8.7×10^{-6} *8*

$^{76}_{34}$Se$_{42}$-34

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									α(N)=7.5×10^{-7} *6* B(M1)(W.u.)=0.0161 *+20−17* if M1, B(E2)(W.u.)=30.9 *+38−32* if E2.
3351.462	$(2)^+$	922.21 *11*	0.51 *8*	2429.131	3^-	[E1]		0.0002127 *30*	α(K)=0.0001898 *27*; α(L)=1.961×10^{-5} *27*; α(M)=3.05×10^{-6} *4* α(N)=2.60×10^{-7} *4* B(E1)(W.u.)=1.67×10^{-5} *+33−30*
		1180.71 *10*	2.10 *15*	2170.572	(0^+)	[E2]		0.000294 *4*	α(K)=0.000257 *4*; α(L)=2.68×10^{-5} *4*; α(M)=4.17×10^{-6} *6* α(N)=3.55×10^{-7} *5*; α(IPF)=5.90×10^{-6} *8* B(E2)(W.u.)=1.84 *+25−21*
		1224.19 *12*	5.06 *33*	2127.224	$(2)^+$	[M1,E2]		0.000270 *9*	α(K)=0.000231 *7*; α(L)=2.40×10^{-5} *8*; α(M)=3.73×10^{-6} *12* α(N)=3.19×10^{-7} *10*; α(IPF)=1.07×10^{-5} *16* B(M1)(W.u.)=0.0041 *5* if M1, B(E2)(W.u.)=3.70 *+48−41* if E2.
		1559.98 *10*	8.9 *8*	1791.437	0^+	[E2]		0.000270 *4*	α(K)=0.0001437 *20*; α(L)=1.487×10^{-5} *21*; α(M)=2.314×10^{-6} *32* α(N)=1.979×10^{-7} *28*; α(IPF)=0.0001091 *15* B(E2)(W.u.)=1.94 *+28−24*
		1564.10 *57*	0.439 *21*	1787.655	2^+	[M1,E2]		0.000258 *14*	α(K)=0.0001411 *27*; α(L)=1.459×10^{-5} *29*; α(M)=2.27×10^{-6} *5* α(N)=1.94×10^{-7} *4*; α(IPF)=0.000100 *11* B(M1)(W.u.)=1.72×10^{-4} *+21−18* if M1, B(E2)(W.u.)=0.094 *+12−10* if E2.
		2135.60 *8*	17.06 *13*	1216.154	2^+	(M1+E2)	−0.042 *10*	0.000411 *6*	α(K)=7.83×10^{-5} *11*; α(L)=8.05×10^{-6} *11*; α(M)=1.252×10^{-6} *18* α(N)=1.075×10^{-7} *15*; α(IPF)=0.000323 *5* B(M1)(W.u.)=0.00262 *+30−24*; B(E2)(W.u.)=0.0014 *+8−6*
		2229.91 *22*	0.390 *29*	1122.279	0^+	[E2]		0.000504 *7*	α(K)=7.36×10^{-5} *10*; α(L)=7.57×10^{-6} *11*; α(M)=1.177×10^{-6} *16* α(N)=1.009×10^{-7} *14*; α(IPF)=0.000422 *6* B(E2)(W.u.)=0.0142 *+20−17*
		2792.61 *21*	100.0 *5*	559.103	2^+	M1+E2	−0.060 *19*	0.000670 *9*	α(K)=4.90×10^{-5} *7*; α(L)=5.03×10^{-6} *7*; α(M)=7.82×10^{-7} *11* α(N)=6.72×10^{-8} *9*; α(IPF)=0.000615 *9* B(M1)(W.u.)=0.0069 *+8−6*; B(E2)(W.u.)=0.0043 *+32−23* Mult.: from α(K)exp in ^{76}Br ε.
		3351.94 *22*	3.09 *12*	0.0	0^+	[E2]		0.000967 *14*	α(K)=3.71×10^{-5} *5*; α(L)=3.80×10^{-6} *5*; α(M)=5.91×10^{-7} *8*

$^{76}_{34}Se_{42}$-35

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
									α(N)=5.07×10^{-8} *7*; α(IPF)=0.000926 *13* B(E2)(W.u.)=0.0147 *+18−15*
3376.37	$1^{(+)},2^+$	3376.29 *12*	100	0.0	0^+				
3377.0	$(1^+,2^+,3^+)$	2160.80 *41*	100	1216.154	2^+				
3403.82	$(2^+,3^+,4^+)$	592.02 *14*	79.9 *34*	2812.130	(3^+)	[M1]			B(M1)(W.u.)=1.45 *+18−15* If E2, B(E2)(W.u.)=5.5×10^{3} *+7−6* exceeds RUL=300; if E1, B(E1)(W.u.)=0.0248 *28* exceeds RUL=0.01;
		2072.68 *12*	100.0 *34*	1330.872	4^+	[M1,E2]		0.000413 *26*	α(K)=8.32×10^{-5} *13*; α(L)=8.57×10^{-6} *14*; α(M)=1.333×10^{-6} *22* α(N)=1.143×10^{-7} *18*; α(IPF)=0.000320 *25* B(M1)(W.u.)=0.042 *+5−4* if M1, B(E2)(W.u.)=13.2 *+17−13* if E2.
3405.9	(1)	3405.8 *7*	100	0.0	0^+	(D)			If M1, B(M1)(W.u.)=0.0027 *5*. If E1, B(E1)(W.u.)=4.7E−5 *8*.
3407.91	(4^+)	548.12 *4*	100.0 *24*	2859.781	4^-	[E1]		0.000664 *9*	α(K)=0.000592 *8*; α(L)=6.16×10^{-5} *9*; α(M)=9.57×10^{-6} *13* α(N)=8.15×10^{-7} *11* B(E1)(W.u.)=0.0035 *+20−16*
		1718.93 *10*	25.9 *24*	1688.971	3^+	[M1,E2]		0.000294 *18*	α(K)=0.0001177 *20*; α(L)=1.215×10^{-5} *22*; α(M)=1.890×10^{-6} *34* α(N)=1.620×10^{-7} *28*; α(IPF)=0.000162 *16* B(M1)(W.u.)=0.0017 *+10−8* if M1, B(E2)(W.u.)=0.78 *+46−35* if E2.
3432.31	7^+	942.8 *5*	100 *8*	2489.35	5^+	E2		0.000484 *7*	B(E2)(W.u.)=40 *13* α(K)=0.000431 *6*; α(L)=4.52×10^{-5} *6*; α(M)=7.03×10^{-6} *10* α(N)=5.99×10^{-7} *8*
		1169.6 *5*	24 *2*	2262.42	6^+	M1(+E2)	+0.08 *15*	0.000280 *4*	B(M1)(W.u.)=0.0033 *+18−15*; B(E2)(W.u.)<0.25 α(K)=0.0002466 *35*; α(L)=2.55×10^{-5} *4*; α(M)=3.97×10^{-6} *6* α(N)=3.41×10^{-7} *5*; α(IPF)=3.46×10^{-6} *8*
3436.09	$1^{(+)},2^+$	2876.40 *28*	100.0 *14*	559.103	2^+	(M1+E2)	+0.64 *+28−20*	0.000724 *16*	α(K)=4.69×10^{-5} *7*; α(L)=4.81×10^{-6} *7*; α(M)=7.48×10^{-7} *11* α(N)=6.42×10^{-8} *9*; α(IPF)=0.000672 *16* B(M1)(W.u.)=0.0081 *+16−20*; B(E2)(W.u.)=0.54 *+31−25*
		3436.28 *20*	28.0 *14*	0.0	0^+	[M1,E2]		0.00096 *4*	α(K)=3.52×10^{-5} *7*; α(L)=3.61×10^{-6} *7*; α(M)=5.61×10^{-7} *10*

$^{76}_{34}Se_{42}$-36

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	α†	Comments
								$\alpha(N)=4.82\times10^{-8}$ *9*; $\alpha(IPF)=0.00092$ *4* B(M1)(W.u.)=0.00188 *+18−16* if M1, B(E2)(W.u.)=0.214 *+20−18* if E2.
3441.27	(3^-)	2882.11 *22*	100	559.103	2^+			
3441.54	7^-	179.2 *5*	8.1 *9*	3262.34	6^-	[M1]	0.02147 *34*	B(M1)(W.u.)=0.070 *+20−14* $\alpha(K)=0.01907$ *30*; $\alpha(L)=0.002056$ *33*; $\alpha(M)=0.000321$ *5* $\alpha(N)=2.72\times10^{-5}$ *4* δ(E2/M1)<0.7 for RUL<300 for E2.
		465.3 *5*	6.3	2975.98	6^+	[E1]	0.000994 *14*	B(E1)(W.u.)=5.3×10^{-5} *+18−13* $\alpha(K)=0.000886$ *13*; $\alpha(L)=9.22\times10^{-5}$ *13*; $\alpha(M)=1.433\times10^{-5}$ *20* $\alpha(N)=1.218\times10^{-6}$ *17*
		616.8 *5*	100 *7*	2824.797	5^-	E2	1.48×10^{-3} *2*	B(E2)(W.u.)=74 *+18−13* $\alpha(K)=0.001314$ *19*; $\alpha(L)=0.0001401$ *20*; $\alpha(M)=2.178\times10^{-5}$ *31* $\alpha(N)=1.840\times10^{-6}$ *26*
		1179.1 *5*	9.0	2262.42	6^+	[E1]	0.0001684 *24*	B(E1)(W.u.)=4.7×10^{-6} *+15−11* $\alpha(K)=0.0001193$ *17*; $\alpha(L)=1.228\times10^{-5}$ *17*; $\alpha(M)=1.909\times10^{-6}$ *27* $\alpha(N)=1.634\times10^{-7}$ *23*; $\alpha(IPF)=3.48\times10^{-5}$ *6*
3459.13	(2^+)	191.68 *15*	0.88 *18*	3267.57	(2^+,3,4^+)			
		267.47 *36*	0.26 *5*	3191.67	$(3)^+$			
		353.68 *17*	1.17 *9*	3105.48	(3^-)			
		389.50 *18*	1.77 *23*	3069.62	2^+			
		647.05 *33*	0.63 *13*	2812.130	(3^+)			
		789.09 *10*	74 *5*	2669.904	2^-			
		803.59 *10*	87 *4*	2655.383	1			
		1029.89 *15*	100 *11*	2429.131	3^-			
		1671.78 *16*	14.2 *6*	1787.655	2^+			
		1769.93 *41*	6.3 *6*	1688.971	3^+			
		2900.53 *20*	63.4 *26*	559.103	2^+			
3466.39	(1,2,3)	796.15 *19*	7.8 *14*	2669.904	2^-			
		2250.64 *23*	2.8 *5*	1216.154	2^+			
		2907.28 *24*	100 *19*	559.103	2^+			
3528.69	1^+	3528.6 *3*	100	0.0	0^+	[M1]	0.000951 *13*	B(M1)(W.u.)=0.0100 *+11−9* $\alpha(K)=3.33\times10^{-5}$ *5*; $\alpha(L)=3.41\times10^{-6}$ *5*; $\alpha(M)=5.31\times10^{-7}$ *7* $\alpha(N)=4.56\times10^{-8}$ *6*; $\alpha(IPF)=0.000913$ *13* E_γ: from (γ,γ').
3552.89	(1,2)	897.57 *11*	31.5 *17*	2655.383	1			
		2337.37 *26*	35.0 *19*	1216.154	2^+			

$^{76}_{34}Se_{42}$-37

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
3552.89	(1,2)	2431.38 *24*	38.2 *20*	1122.279	0^+			
		2994.27 *20*	100 *6*	559.103	2^+			
		3553.53 *96*	7.1 *18*	0.0	0^+			
3556.210	(2^-)	287.32 *25*	1.32 *13*	3268.70	$(1^-,2)$			
		288.68 *20*	0.085 *26*	3267.57	$(2^+,3,4^+)$			
		336.61 *12*	2.1 *5*	3219.428	$(2^+,3^+)$			
		450.83 *13*	1.78 *14*	3105.48	(3^-)			
		486.44 *10*	10.5 *7*	3069.62	2^+			
		581.20 *11*	1.18 *16*	2975.00	$(2^+,3,4^+)$			
		605.97 *14*	2.3 *4*	2950.171	1^+			
		686.81 *12*	1.69 *12*	2869.34	$(1^+,2^+)$			
		696.39 *10*	5.4 *33*	2859.781	4^-			
		738.88 *13*	0.57 *5*	2817.24	(2^+)			
		744.40 *45*	0.44 *4*	2812.130	(3^+)			
		886.14 *12*	32.4 *21*	2669.904	2^-			
		900.71 *10*	10.9 *5*	2655.383	1			
		1127.15 *23*	15.4 *22*	2429.131	3^-			
		1428.91 *10*	27.5 *18*	2127.224	$(2)^+$			
		1768.52 *10*	24.5 *10*	1787.655	2^+			
		1867.35 *10*	13.8 *13*	1688.971	3^+			
		2339.53 *21*	6.54 *26*	1216.154	2^+			
		2997.40 *8*	100 *4*	559.103	2^+			
3566.6	$1^{(+)}$	3566.5 *10*	100	0.0	0^+	(M1)	0.000964 *14*	α(K)=3.28×10^{-5} *5*; α(L)=3.36×10^{-6} *5*; α(M)=5.22×10^{-7} *7* α(N)=4.48×10^{-8} *6*; α(IPF)=0.000928 *13* B(M1)(W.u.)=0.0031 *+6−4*
3604.192	1^+	734.78 *14*	0.238 *19*	2869.34	$(1^+,2^+)$			
		934.26 *12*	4.9 *4*	2669.904	2^-	[E1]	0.0002073 *29*	α(K)=0.0001850 *26*; α(L)=1.911×10^{-5} *27*; α(M)=2.97×10^{-6} *4* α(N)=2.54×10^{-7} *4* B(E1)(W.u.)=3.14×10^{-4} *+43−36*
		948.70 *13*	2.91 *14*	2655.383	1			
		999.96 *10*	2.46 *18*	2604.09	$1^+,2^+$			
		1089.42 *10*	5.17 *27*	2514.681	2^+	[M1,E2]	0.000332 *14*	α(K)=0.000296 *12*; α(L)=3.08×10^{-5} *14*; α(M)=4.79×10^{-6} *21* α(N)=4.10×10^{-7} *17* B(M1)(W.u.)=0.0122 *+14−12* if M1, B(E2)(W.u.)=13.8 *+16−14* if E2.
		1433.53 *10*	2.37 *16*	2170.572	(0^+)	[M1]	0.0002337 *33*	α(K)=0.0001648 *23*; α(L)=1.702×10^{-5} *24*; α(M)=2.65×10^{-6} *4* α(N)=2.272×10^{-7} *32*; α(IPF)=4.90×10^{-5} *7* B(M1)(W.u.)=0.00245 *+31−27*
		1476.91 *10*	0.70 *11*	2127.224	$(2)^+$	[M1,E2]	0.000246 *11*	α(K)=0.0001579 *32*; α(L)=1.63×10^{-5} *4*; α(M)=2.54×10^{-6} *6*

Adopted Levels, Gammas (continued)

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	α†	Comments
								α(N)=2.18×10^{-7} *5*; α(IPF)=6.9×10^{-5} *8* B(M1)(W.u.)=6.6×10^{-4} *+13−12* if M1, B(E2)(W.u.)=0.41 *+8−7* if E2.
3604.192	1$^+$	1812.92 *12*	1.9 *5*	1791.437	0$^+$	[M1]	0.000301 *4*	B(M1)(W.u.)=9.7×10^{-4} *+28−26* α(K)=0.0001055 *15*; α(L)=1.087×10^{-5} *15*; α(M)=1.691×10^{-6} *24* α(N)=1.451×10^{-7} *20*; α(IPF)=0.0001825 *26*
		1816.71 *12*	2.06 *10*	1787.655	2$^+$	[M1,E2]	0.000322 *21*	α(K)=0.0001061 *18*; α(L)=1.094×10^{-5} *19*; α(M)=1.701×10^{-6} *29* α(N)=1.458×10^{-7} *24*; α(IPF)=0.000203 *19* B(M1)(W.u.)=0.00105 *+12−11* if M1, B(E2)(W.u.)=0.426 *+49−42* if E2.
		2482.60 *20*	6.42 *27*	1122.279	0$^+$	[M1]	0.000545 *8*	B(M1)(W.u.)=0.00128 *+15−12* α(K)=6.00×10^{-5} *8*; α(L)=6.16×10^{-6} *9*; α(M)=9.58×10^{-7} *13* α(N)=8.23×10^{-8} *12*; α(IPF)=0.000478 *7*
		3045.51 *20*	2.15 *24*	559.103	2$^+$	[M1,E2]	0.00081 *4*	α(K)=4.28×10^{-5} *7*; α(L)=4.39×10^{-6} *8*; α(M)=6.83×10^{-7} *12* α(N)=5.86×10^{-8} *10*; α(IPF)=0.00076 *4* B(M1)(W.u.)=2.32×10^{-4} *+37−32* if M1, B(E2)(W.u.)=0.034 *5* if E2.
		3604.01 *8*	100 *3*	0.0	0$^+$	(M1)	0.000978 *14*	B(M1)(W.u.)=0.0065 *+7−6* α(K)=3.22×10^{-5} *5*; α(L)=3.30×10^{-6} *5*; α(M)=5.13×10^{-7} *7* α(N)=4.41×10^{-8} *6*; α(IPF)=0.000941 *13* E_γ: weighted average of 3603.99 *8* from ^{76}Br ε+β$^+$ decay (16.14 h) and 3604.3 *3* from (γ,γ′). I_γ: from ^{76}Br ε+β$^+$ decay (16.14 h).
3636.88	(2$^+$)	531.36 *37*	1.64 *18*	3105.48	(3$^-$)			
		767.61 *14*	1.64 *18*	2869.34	(1$^+$,2$^+$)			
		966.78 *11*	9.7 *7*	2669.904	2$^-$			
		981.24 *20*	26.9 *28*	2655.383	1			
		1122.12 *43*	7.8 *26*	2514.681	2$^+$			
		1466.13 *35*	2.4 *5*	2170.572	(0$^+$)			
		1509.44 *11*	28.7 *21*	2127.224	(2)$^+$			
		1845.58 *16*	90 *8*	1791.437	0$^+$			
		1848.72 *72*	23.6 *13*	1787.655	2$^+$			
		2421.08 *20*	17.7 *9*	1216.154	2$^+$			
		2515.16 *59*	100 *4*	1122.279	0$^+$			
		3078.56 *21*	10.0 *5*	559.103	2$^+$			
3651.88	(1$^+$,2$^+$,3$^+$)	701.66 *12*	10.8 *19*	2950.171	1$^+$			
		1963.00 *34*	6.5 *7*	1688.971	3$^+$			
		2436.05 *27*	8.2 *7*	1216.154	2$^+$			

From ENSDF

$^{76}_{34}$Se$_{42}$-39

Adopted Levels, Gammas (continued)

$\gamma(^{76}$Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
3651.88	$(1^+,2^+,3^+)$	3092.95 *20*	100 *6*	559.103	2^+				
3657.7?	(1,2)	3098.3[b] *5*	100	559.103	2^+				
		3657.8 *5*		0.0	0^+				
3670.2	$1^{(+)}$	3670.1 *4*	100	0.0	0^+	(M1)		1.00×10^{-3} *1*	α(K)=3.13×10^{-5} *4*; α(L)=3.20×10^{-6} *4*; α(M)=4.98×10^{-7} *7* α(N)=4.28×10^{-8} *6*; α(IPF)=0.000965 *14* B(M1)(W.u.)=0.0061 *+8−6* E_γ: from (γ,γ') only.
3696.27	(7^-)	254.5 *5*	100 *8*	3441.54	7^-	(M1+E2)	+0.045 *5*	0.00882 *13*	B(M1)(W.u.)=0.019 *+7−4*; B(E2)(W.u.)=0.79 *+36−23* α(K)=0.00784 *12*; α(L)=0.000838 *12*; α(M)=0.0001305 *19* α(N)=1.110×10^{-5} *17* Mult.: $\gamma(\theta)$ in $(\alpha,2n\gamma)$ consistent with ΔJ=0.
		384.2 *5*	42	3312.04	(6^-)	(M1+E2)	≈−0.9	≈0.00464	B(M1)(W.u.)=0.0013 *+8−5*; B(E2)(W.u.)=9 *6* α(K)≈0.00412; α(L)≈0.000445; α(M)≈6.92×10^{-5} α(N)≈5.82×10^{-6}
		434.1 *5*	28	3262.34	6^-	[M1+E2]		0.0034 *9*	α(K)=0.0030 *8*; α(L)=3.2×10^{-4} *9*; α(M)=5.0×10^{-5} *15* α(N)=4.2×10^{-6} *12* B(M1)(W.u.)=0.00106 *+43−28* if M1, B(E2)(W.u.)=7.6 *+31−20* if E2.
		650.8 *5*	83	3045.79	(5^-)	[E2]		1.27×10^{-3} *2*	B(E2)(W.u.)=3.0 *+11−7* α(K)=0.001129 *16*; α(L)=0.0001201 *17*; α(M)=1.868×10^{-5} *26* α(N)=1.579×10^{-6} *22*
3716.52	(2)	1060.87 *10*	24.2 *12*	2655.383	1				
		1929.05 *11*	14.9 *8*	1787.655	2^+				
		2028.04 *54*	7.6 *8*	1688.971	3^+				
		3157.64 *20*	100 *4*	559.103	2^+	D(+Q)	+0.004 *+34−35*		Mult.: $\gamma(\theta)$ in ^{76}Br ε decay consistent with ΔJ=0 or 2.
3752.1	$1^{(+)}$	3752.0 *14*	100	0.0	0^+	(M1)		1.03×10^{-3} *1*	B(M1)(W.u.)=0.0024 *+9−5* α(K)=3.02×10^{-5} *4*; α(L)=3.09×10^{-6} *4*; α(M)=4.81×10^{-7} *7* α(N)=4.13×10^{-8} *6*; α(IPF)=0.000995 *14*
3758.79	1	2542.6 *8*	19 *5*	1216.154	2^+				
		2636.1 *6*	42 *6*	1122.279	0^+	D			IF M1, B(M1)(W.u.)=0.040 *8*. IF E1, B(E1)(W.u.)=0.00069 *13*.

From ENSDF

$^{76}_{34}$Se$_{42}$-40

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
3758.79	1	3199.8 *3*	47 *5*	559.103	2^+				
		3758.6 *3*	100 *9*	0.0	0^+	D			IF M1, B(M1)(W.u.)=0.033 *5*. IF E1, B(E1)(W.u.)=0.00057 *9*.
3785.7	(8^+)	515.7 *5*	89	3269.75	8^+	[M1+E2]		0.0021 *4*	α(K)=0.0018 *4*; α(L)=0.00020 *4*; α(M)=3.0×10^{-5} *7* α(N)=2.6×10^{-6} *6* B(M1)(W.u.)=0.084 *+46−31* if M1. B(E2)(W.u.)=4.2×10^2 *+23−16* exceeds RUL=300 if E2.
		1523.5 *5*	100	2262.42	6^+	[E2]		0.000263 *4*	B(E2)(W.u.)=2.1 *+11−8* α(K)=0.0001506 *21*; α(L)=1.560×10^{-5} *22*; α(M)=2.427×10^{-6} *34* α(N)=2.076×10^{-7} *29*; α(IPF)=9.44×10^{-5} *13* Mult.: $\gamma(\theta)$ in (α,2nγ) consistent with ΔJ=0,2.
3853.75	$(8)^+$	583.9 *5*	58 *4*	3269.75	8^+	M1+E2	−0.45 *25*	0.00131 *8*	B(M1)(W.u.)=0.147 *49*; B(E2)(W.u.)=1.2×10^2 *+12−9* α(K)=0.00116 *7*; α(L)=0.000122 *8*; α(M)=1.90×10^{-5} *13* α(N)=1.62×10^{-6} *11*
		878.3		2975.98	6^+				E_γ: γ from (^{12}C,α2nγ) only.
		1591.1 *5*	100	2262.42	6^+	[E2]		0.000277 *4*	B(E2)(W.u.)=8.0 *22* α(K)=0.0001382 *19*; α(L)=1.430×10^{-5} *20*; α(M)=2.224×10^{-6} *31* α(N)=1.903×10^{-7} *27*; α(IPF)=0.0001222 *17*
3857.8	1^+	3857.7 *11*	100	0.0	0^+	(M1)		1.07×10^{-3} *2*	B(M1)(W.u.)=0.0022 *+6−4* α(K)=2.89×10^{-5} *4*; α(L)=2.96×10^{-6} *4*; α(M)=4.60×10^{-7} *6* α(N)=3.95×10^{-8} *6*; α(IPF)=0.001034 *14*
3880.46		1225.07 *18*	100	2655.383	1				
3915.48	(2^-)	647.79 *20*	4.9 *18*	3267.57	$(2^+,3,4^+)$				
		695.70 *33*	36 *9*	3219.428	$(2^+,3^+)$				
		809.89 *12*	3.04 *29*	3105.48	(3^-)				
		845.76 *17*	27.5 *27*	3069.62	2^+				
		965.33 *15*	8.6 *11*	2950.171	1^+				
		1055.90 *13*	1.9 *13*	2859.781	4^-				
		1103.25 *10*	30 *6*	2812.130	(3^+)				
		1245.49 *32*	8.8 *8*	2669.904	2^-				
		1400.74 *18*	8.7 *8*	2514.681	2^+				
		1787.99 *32*	58 *5*	2127.224	$(2)^+$				
		2226.68 *20*	61 *6*	1688.971	3^+				

From ENSDF

$^{76}_{34}Se_{42}$-41

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	α†	Comments
3915.48	(2⁻)	2699.08 *20*	28.6 *26*	1216.154	2⁺			
		3356.87 *20*	100 *5*	559.103	2⁺			
3922.5	1	3922.4 *4*	100	0.0	0⁺	D		If M1, B(M1)(W.u.)=0.0087 *9*. If E1, B(E1)(W.u.)=0.000149 *15*.
3930.02	(1,2⁺)	1060.51 *25*	3.94 *32*	2869.34	(1⁺,2⁺)			
		1259.87 *19*	17.8 *13*	2669.904	2⁻			
		1759.34 *13*	1.23 *13*	2170.572	(0⁺)			
		1802.65 *11*	26.1 *18*	2127.224	(2)⁺			
		2142.50 *21*	10.5 *7*	1787.655	2⁺			
		2714.09 *20*	37.8 *25*	1216.154	2⁺			
		2808.17 *22*	46.2 *19*	1122.279	0⁺			
		3371.00 *20*	100 *7*	559.103	2⁺			
		3929.96 *40*	65 *4*	0.0	0⁺			
3970.407	(2⁺)	701.64 *10*	15.3 *14*	3268.70	(1⁻,2)			
		750.94 *20*	0.97 *24*	3219.428	(2⁺,3⁺)			
		778.84 *12*	7.0 *13*	3191.67	(3)⁺			
		810.32 *18*	6.4 *5*	3160.115	(2⁺)			
		864.93 *11*	2.92 *22*	3105.48	(3⁻)			
		900.82 *14*	27.7 *18*	3069.62	2⁺			
		995.41 *13*	11.9 *15*	2975.00	(2⁺,3,4⁺)			
		1020.32 *11*	7.1 *4*	2950.171	1⁺			
		1101.07 *11*	21.6 *15*	2869.34	(1⁺,2⁺)			
		1153.14 *10*	21.8 *18*	2817.24	(2⁺)			
		1158.27 *10*	9.4 *7*	2812.130	(3⁺)			
		1300.48 *12*	43.8 *29*	2669.904	2⁻			
		1314.70 *11*	22.4 *27*	2655.383	1			
		1455.63 *10*	30.5 *16*	2514.681	2⁺			
		1541.25 *11*	8.0 *13*	2429.131	3⁻			
		2183.01 *20*	55.8 *24*	1787.655	2⁺			
		2754.54 *20*	5.8 *6*	1216.154	2⁺			
		3411.55 *20*	100 *4*	559.103	2⁺			
4005.1		309.3 *5*	100	3696.27	(7⁻)			
4008.7	(8⁻)	746.3 *5*	100	3262.34	6⁻	E2	0.000874 *12*	B(E2)(W.u.)=58 *+27−14* α(K)=0.000778 *11*; α(L)=8.23×10⁻⁵ *12*; α(M)=1.280×10⁻⁵ *18* α(N)=1.085×10⁻⁶ *15*
4045.61	1⁺	1440.7 *12*	13.0 *19*	2604.09	1⁺,2⁺			
		1918.41 *45*	56 *5*	2127.224	(2)⁺	[M1,E2]	0.000356 *23*	α(K)=9.59×10⁻⁵ *16*; α(L)=9.88×10⁻⁶ *16*; α(M)=1.537×10⁻⁶ *26* α(N)=1.317×10⁻⁷ *21*; α(IPF)=0.000249 *22* B(M1)(W.u.)=0.0151 *+22−19* if M1, B(E2)(W.u.)=5.5 *+8−7* if E2.
		2258.06 *23*	100 *5*	1787.655	2⁺	[M1,E2]	0.000487 *30*	α(K)=7.14×10⁻⁵ *11*; α(L)=7.34×10⁻⁶ *12*; α(M)=1.142×10⁻⁶ *18* α(N)=9.80×10⁻⁸ *15*; α(IPF)=0.000407 *30*

$^{76}_{34}Se_{42}$-42

γ(^{76}Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	α†	Comments
								E_γ,I_γ: from ^{76}Br $\varepsilon+\beta^+$ decay (16.14 h). B(M1)(W.u.)=0.0165 +*21*−*17* if M1, B(E2)(W.u.)=4.3 +*6*−*5* if E2.
4045.61	1^+	2356.89 *21*	38 *5*	1688.971	3^+	[E2]	0.000558 *8*	α(K)=6.67×10^{-5} *9*; α(L)=6.86×10^{-6} *10*; α(M)=1.067×10^{-6} *15* α(N)=9.15×10^{-8} *13*; α(IPF)=0.000484 *7* B(E2)(W.u.)=1.33 +*23*−*20*
		2830.11 *23*	66 *4*	1216.154	2^+	[M1,E2]	0.00072 *4*	α(K)=4.84×10^{-5} *8*; α(L)=4.96×10^{-6} *8*; α(M)=7.72×10^{-7} *13* α(N)=6.63×10^{-8} *11*; α(IPF)=0.00067 *4* B(M1)(W.u.)=0.0055 +*8*−*6* if M1, B(E2)(W.u.)=0.93 +*13*−*10* if E2.
		4046.2 *3*	100	0.0	0^+	(M1)	1.13×10^{-3} *2*	B(M1)(W.u.)=0.0029 *5* α(K)=2.69×10^{-5} *4*; α(L)=2.75×10^{-6} *4*; α(M)=4.27×10^{-7} *6* α(N)=3.67×10^{-8} *5*; α(IPF)=0.001100 *15*
4055.22	1^+	4055.1 *3*	100	0.0	0^+	M1	1.13×10^{-3} *2*	B(M1)(W.u.)=1.13×10^{-5} +*11*−*9* α(K)=2.68×10^{-5} *4*; α(L)=2.74×10^{-6} *4*; α(M)=4.26×10^{-7} *6* α(N)=3.66×10^{-8} *5*; α(IPF)=0.001102 *15*
4083.68	$(1^-,2)$	816.29 *13*	1.55 *24*	3267.57	$(2^+,3,4^+)$			
		864.16 *70*	3.5 *8*	3219.428	$(2^+,3^+)$			
		979.0 *17*	0.66 *10*	3105.48	(3^-)			
		1133.70 *61*	7.7 *4*	2950.171	1^+			
		1271.45 *12*	5.8 *5*	2812.130	(3^+)			
		1413.70 *14*	2.66 *24*	2669.904	2^-			
		1428.61 *57*	5.7 *34*	2655.383	1			
		1568.63 *14*	8.6 *12*	2514.681	2^+			
		1654.57 *21*	41 *5*	2429.131	3^-			
		2296.07 *26*	6.00 *17*	1787.655	2^+			
		3524.99 *20*	100 *4*	559.103	2^+			
4086.58	$(1,2,3^+)$	1136.10 *71*	14.7 *31*	2950.171	1^+			
		1416.48 *49*	12.5 *22*	2669.904	2^-			
		1431.9 *22*	17 *6*	2655.383	1			
		2298.95 *22*	100 *6*	1787.655	2^+			
4125.5	1^+	4125.4 *10*	100	0.0	0^+	M1	1.15×10^{-3} *2*	B(M1)(W.u.)=0.0026 +*7*−*4* α(K)=2.61×10^{-5} *4*; α(L)=2.66×10^{-6} *4*; α(M)=4.14×10^{-7} *6* α(N)=3.56×10^{-8} *5*; α(IPF)=0.001124 *16*
4151.36	(2)	1481.34 *11*	78 *7*	2669.904	2^-			
		1495.89 *13*	78 *4*	2655.383	1			
		1636.56 *10*	67.8 *35*	2514.681	2^+			
		1722.24 *12*	100 *15*	2429.131	3^-			

$^{76}_{34}$Se$_{42}$-43

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ ‡	I_γ ‡	E_f	J^π_f	Mult.#	α†	Comments
4151.36	(2)	2364.10 *23*	46.9 *29*	1787.655	2^+			
		2462.82 *20*	90 *9*	1688.971	3^+			
4174.33	(1,2)	1504.32 *10*	63 *5*	2669.904	2^-			
		1518.79 *10*	55.8 *27*	2655.383	1			
		1659.66 *30*	13.2 *6*	2514.681	2^+			
		2003.79 *20*	6.9 *5*	2170.572	(0^+)			
		2047.10 *21*	62 *5*	2127.224	$(2)^+$			
		2383.45 *20*	53 *8*	1791.437	0^+			
		2386.77 *33*	100 *12*	1787.655	2^+			
		3052.38 *26*	18.1 *26*	1122.279	0^+			
		3615.08 *22*	6.0 *8*	559.103	2^+			
		4174.22 *40*	20.0 *16*	0.0	0^+			
4199.19	$(1^-,2)$	482.72 *29*	6.6 *5*	3716.52	(2)			
		980.1 *13*	10.7 *26*	3219.428	$(2^+,3^+)$			
		1093.62 *10*	21.3 *17*	3105.48	(3^-)			
		1249.15 *25*	12.6 *12*	2950.171	1^+			
		1329.77 *30*	5.0 *4*	2869.34	$(1^+,2^+)$			
		1543.69 *15*	12.9 *8*	2655.383	1			
		1684.40 *12*	10.1 *6*	2514.681	2^+			
		1770.02 *10*	56 *8*	2429.131	3^-			
		2072.05 *22*	71 *5*	2127.224	$(2)^+$			
		2411.79 *20*	47.0 *23*	1787.655	2^+			
		2983.39 *20*	38.5 *21*	1216.154	2^+			
		3639.99 *20*	100 *5*	559.103	2^+			
4205.44	$(1^-,2)$	937.73 *13*	8.6 *13*	3267.57	$(2^+,3,4^+)$			
		985.62 *10*	79 *19*	3219.428	$(2^+,3^+)$			
		1255.15 *44*	44 *6*	2950.171	1^+			
		1335.66 *34*	1.43 *22*	2869.34	$(1^+,2^+)$			
		1388.08 *11*	9.9 *11*	2817.24	(2^+)			
		1393.21 *10*	43 *4*	2812.130	(3^+)			
		1549.99 *14*	31.7 *18*	2655.383	1			
		1776.22 *11*	100 *13*	2429.131	3^-			
		2989.94 *69*	14.1 *22*	1216.154	2^+			
		3646.17 *21*	50.1 *24*	559.103	2^+			
4214.0	(8^-)	518.0 *5*	37	3696.27	(7^-)	[M1+E2]	0.0020 *4*	α(K)=0.0018 *4*; α(L)=0.00019 *4*; α(M)=3.0×10^{-5} *7* α(N)=2.5×10^{-6} *6* B(M1)(W.u.)=0.025 *+22−12* if M1, B(E2)(W.u.)=1.3×10^{2} *+11−6* if E2.
		901.7 *5*	100 *5*	3312.04	(6^-)	E2	0.000539 *8*	B(E2)(W.u.)=21 *+19−10* α(K)=0.000480 *7*; α(L)=5.05×10^{-5} *7*; α(M)=7.85×10^{-6} *11* α(N)=6.68×10^{-7} *9*

$^{76}_{34}Se_{42}$-44

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	α†	Comments
4218.81	1^+	3659.6 *1*	100 *8*	559.103	2^+	(M1)	0.000997 *14*	B(M1)(W.u.)=0.077 *+11−9* α(K)=3.15×10^{-5} *4*; α(L)=3.22×10^{-6} *5*; α(M)=5.01×10^{-7} *7* α(N)=4.30×10^{-8} *6*; α(IPF)=0.000962 *13*
		4218.8 *3*	95 *8*	0.0	0^+	M1	1.18×10^{-3} *2*	B(M1)(W.u.)=0.048 *+7−6* α(K)=2.517×10^{-5} *35*; α(L)=2.57×10^{-6} *4*; α(M)=4.00×10^{-7} *6* α(N)=3.44×10^{-8} *5*; α(IPF)=0.001153 *16*
4249.20	(1,2)	2121.95 *38*	100 *12*	2127.224	$(2)^+$			
		4249.06 *41*	7.1 *14*	0.0	0^+			
4257.59	(1,2)	2087.00 *28*	14.7 *13*	2170.572	(0^+)			
		2470.0 *11*	91 *7*	1787.655	2^+			
		3042.4 *15*	100 *9*	1216.154	2^+			
		3698.41 *26*	47 *5*	559.103	2^+			
		4257.79 *43*	14.7 *13*	0.0	0^+			
4298.87	$(1,2,3^+)$	1107.17 *11*	11.2 *17*	3191.67	$(3)^+$			
		1349.0 *13*	21.2 *17*	2950.171	1^+			
		1481.59 *20*	30.7 *29*	2817.24	(2^+)			
		1628.81 *28*	100 *7*	2669.904	2^-			
		1643.28 *28*	23 *4*	2655.383	1			
		3082.92 *21*	61 *8*	1216.154	2^+			
4299.5	10^+	1029.8 *5*	100	3269.75	8^+	E2	0.000393 *6*	B(E2)(W.u.)=52 *9* α(K)=0.000350 *5*; α(L)=3.66×10^{-5} *5*; α(M)=5.69×10^{-6} *8* α(N)=4.85×10^{-7} *7*
4324.6	$(9)^-$	883.0 *5*	100	3441.54	7^-	E2	0.000568 *8*	B(E2)(W.u.)=39 *+16−9* α(K)=0.000506 *7*; α(L)=5.32×10^{-5} *7*; α(M)=8.27×10^{-6} *12* α(N)=7.03×10^{-7} *10*
4328.36	(1,2)	724.15 *11*	13.3 *7*	3604.192	1^+			
		976.89 *16*	7.9 *8*	3351.462	$(2)^+$			
		1672.95 *10*	100 *5*	2655.383	1			
		4328.36 *42*	0.33 *6*	0.0	0^+			
4329.2	1	3112.4 *6*	100 *14*	1216.154	2^+			
		4329.7 *6*	30 *6*	0.0	0^+			
4347.53	(1,2)	3131.30 *56*	100 *5*	1216.154	2^+			
		4347.40 *41*	23.7 *13*	0.0	0^+			
4366.55		649.76 *40*	64 *5*	3716.52	(2)			
		1098.81 *15*	100 *11*	3267.57	$(2^+,3,4^+)$			
		1146.32 *64*	37 *9*	3219.428	$(2^+,3^+)$			
		2239.60 *24*	57 *7*	2127.224	$(2)^+$			
		2677.57 *28*	29.6 *35*	1688.971	3^+			
		3150.67 *26*	18.3 *35*	1216.154	2^+			
4383.97	$1^+,2^+,3^+$	2257[ab]		2127.224	$(2)^+$			

$^{76}_{34}Se_{42}$-45

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
4405.9	(9^+)	973.1 *5*	100	3432.31	7^+	(E2)	0.000449 *6*	B(E2)(W.u.)=38 +*11*−*7* α(K)=0.000400 *6*; α(L)=4.19×10^{-5} *6*; α(M)=6.52×10^{-6} *9* α(N)=5.55×10^{-7} *8*
		1136.1		3269.75	8^+			E_γ: from (^{12}C,α2nγ).
4411.65	(2)	859.45 *12*	7.1 *11*	3552.89	(1,2)			
		945.27 *18*	26 *7*	3466.39	(1,2,3)			
		1143.89 *12*	16.3 *12*	3267.57	$(2^+,3,4^+)$			
		1191.79 *10*	17 *4*	3219.428	$(2^+,3^+)$			
		1219.73 *59*	8.2 *11*	3191.67	$(3)^+$			
		1342.03 *12*	40.0 *27*	3069.62	2^+			
		1461.42 *12*	17.2 *8*	2950.171	1^+			
		1542.28 *38*	1.92 *16*	2869.34	$(1^+,2^+)$			
		1599.21 *25*	38.2 *29*	2812.130	(3^+)			
		1741.51[b] *10*	100 *7*	2669.904	2^-			
		1756.42 *11*	27.2 *14*	2655.383	1			
		1896.96 *34*	1.14 *26*	2514.681	2^+			
		1982.31 *46*	17.0 *29*	2429.131	3^-			
		2284.54 *24*	6.0 *5*	2127.224	$(2)^+$			
		2624.11 *20*	20.6 *12*	1787.655	2^+			
		2722.99 *21*	5.1 *5*	1688.971	3^+			
		3195.52 *20*	13.8 *9*	1216.154	2^+			
		3853.03 *45*	0.10 *5*	559.103	2^+			
4437.72	$(1^+,2^+)$	721.22 *11*	5.8 *5*	3716.52	(2)			
		1277.59 *15*	26 *4*	3160.115	(2^+)			
		1782.38 *11*	14.2 *6*	2655.383	1			
		1833.61 *25*	19.9 *15*	2604.09	$1^+,2^+$			
		1922.89 *10*	75 *4*	2514.681	2^+			
		2267.05 *20*	12.1 *10*	2170.572	(0^+)			
		2310.69 *27*	58 *8*	2127.224	$(2)^+$			
		2650.64 *44*	9.8 *15*	1787.655	2^+			
		3221.81 *20*	17.1 *10*	1216.154	2^+			
		3315.98 *52*	3.59 *33*	1122.279	0^+			
		3878.09 *23*	1.09 *22*	559.103	2^+			
		4437.33 *40*	100 *6*	0.0	0^+			
4451.92	$(1^+,2^+)$	1501.99 *24*	28.9 *22*	2950.171	1^+			
		1796.56 *21*	21.7 *17*	2655.383	1			
		3235.88 *22*	28.3 *17*	1216.154	2^+			
		3892.32 *20*	100 *6*	559.103	2^+			
		4451.81 *40*	59.4 *33*	0.0	0^+			
4473.46	(2^+)	1803.44 *13*	39 *4*	2669.904	2^-			
		1817.96 *19*	39 *5*	2655.383	1			

$^{76}_{34}Se_{42}$-46

γ(^{76}Se) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
4473.46	(2$^+$)	3257.58 *21*	37.0 *21*	1216.154	2$^+$			
		3913.93 *21*	100 *6*	559.103	2$^+$			
4489.23	(1,2)	936.04 *26*	24.6 *33*	3552.89	(1,2)			
		1137.74 *10*	44.3 *35*	3351.462	(2)$^+$			
		1539.05 *30*	9.7 *6*	2950.171	1$^+$			
		1819.27 *12*	9.0 *8*	2669.904	2$^-$			
		1833.87 *10*	100 *5*	2655.383	1			
		2698.18 *21*	10.3 *12*	1791.437	0$^+$			
		3366.2 *19*	9.9 *6*	1122.279	0$^+$			
		3930.06 *40*	32.4 *22*	559.103	2$^+$			
		4488.56 *40*	3.24 *34*	0.0	0$^+$			
4523.47	(3$^-$)	1255.89 *72*	43 *20*	3267.57	(2$^+$,3,4$^+$)			
		1304.1 *10*	30 *7*	3219.428	(2$^+$,3$^+$)			
		1653.91 *63*	29.3 *35*	2869.34	(1$^+$,2$^+$)			
		1711.26 *12*	80 *13*	2812.130	(3$^+$)			
		2008.33 *83*	19.0 *26*	2514.681	2$^+$			
		2835.30 *45*	25.9 *35*	1688.971	3$^+$			
		3307.29 *21*	100 *10*	1216.154	2$^+$			
4532.91	(1$^-$,2,3)	1265.30 *78*	30 *11*	3267.57	(2$^+$,3,4$^+$)			
		1862.81 *13*	100 *8*	2669.904	2$^-$			
		2103.93 *60*	50 *14*	2429.131	3$^-$			
		2746.09 *47*	41 *6*	1787.655	2$^+$			
		3974.67 *41*	55.4 *27*	559.103	2$^+$			
4534.93	(0,1,2)	1584.72 *10*	57.9 *28*	2950.171	1$^+$			
		1879.55 *12*	100 *5*	2655.383	1			
4535.7	1$^+$	3977.2 *11*	68 *13*	559.103	2$^+$	[M1]	1.11×10^{-3} *2*	B(M1)(W.u.)=0.0140 *+35−29* α(K)=2.76×10^{-5} *4*; α(L)=2.82×10^{-6} *4*; α(M)=4.39×10^{-7} *6* α(N)=3.77×10^{-8} *5*; α(IPF)=0.001077 *15*
		4535.4 *6*	100 *13*	0.0	0$^+$	M1	1.28×10^{-3} *2*	B(M1)(W.u.)=0.0139 *+32−24* α(K)=2.254×10^{-5} *32*; α(L)=2.304×10^{-6} *32*; α(M)=3.58×10^{-7} *5* α(N)=3.08×10^{-8} *4*; α(IPF)=0.001260 *18*
4576.11	(1,2)	1906.26 *35*	67 *11*	2669.904	2$^-$			
		1921.1 *12*	76 *31*	2655.383	1			
		3453.80 *27*	50 *5*	1122.279	0$^+$			
		4575.70 *40*	100 *11*	0.0	0$^+$			
4581.05	(1,2)	1313.70 *81*	4.0 *21*	3267.57	(2$^+$,3,4$^+$)			
		1420.92 *49*	20 *7*	3160.115	(2$^+$)			
		1605.80 *88*	4.1 *6*	2975.00	(2$^+$,3,4$^+$)			
		1911.10 *12*	9.2 *10*	2669.904	2$^-$			
		2152.17 *35*	6.1 *18*	2429.131	3$^-$			
		2454.00 *52*	20.2 *16*	2127.224	(2)$^+$			

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
4581.05	(1,2)	3364.74 *32*	11.2 *9*	1216.154	2^+			
		4021.65 *40*	100 *9*	559.103	2^+			
4603.26	$(1,2)^+$	4043.89 *40*	61 *5*	559.103	2^+			
		4603.27 *40*	100 *5*	0.0	0^+			
4603.3	1^-	4603.1 *6*	100 *5*	0.0	0^+	E1	1.91×10^{-3} *3*	B(E1)(W.u.)=4.8×10^{-4} *+20−11* α(K)=1.624×10^{-5} *23*; α(L)=1.655×10^{-6} *23*; α(M)=2.57×10^{-7} *4* α(N)=2.209×10^{-8} *31*; α(IPF)=0.001887 *26*
4663.08	1^-	4104.2 *5*	32 *4*	559.103	2^+	(E1)	1.73×10^{-3} *2*	B(E1)(W.u.)=2.4×10^{-4} *+6−5* α(K)=1.873×10^{-5} *26*; α(L)=1.910×10^{-6} *27*; α(M)=2.97×10^{-7} *4* α(N)=2.55×10^{-8} *4*; α(IPF)=0.001713 *24*
		4662.7 *4*	100 *10*	0.0	0^+	E1	1.92×10^{-3} *3*	B(E1)(W.u.)=5.2×10^{-4} *+11−8* α(K)=1.598×10^{-5} *22*; α(L)=1.629×10^{-6} *23*; α(M)=2.532×10^{-7} *35* α(N)=2.174×10^{-8} *30*; α(IPF)=0.001905 *27*
4673.7	1^+	4673.5 *14*	100	0.0	0^+	M1	1.32×10^{-3} *2*	B(M1)(W.u.)=0.0040 *+19−10* α(K)=2.154×10^{-5} *30*; α(L)=2.201×10^{-6} *31*; α(M)=3.42×10^{-7} *5* α(N)=2.94×10^{-8} *4*; α(IPF)=0.001299 *18*
4687.21	$(1,2,3^+)$	1736.92 *17*	100 *11*	2950.171	1^+			
		1875.23 *16*	65 *25*	2812.130	(3^+)			
		2017.14 *46*	52 *6*	2669.904	2^-			
		3470.50 *50*	63 *4*	1216.154	2^+			
		4127.74 *50*	6.3 *21*	559.103	2^+			
4687.3	$(10)^+$	388.0 *5*	30	4299.5	10^+	[M1]	0.00314 *4*	B(M1)(W.u.)=0.108 *+29−25* α(K)=0.00279 *4*; α(L)=0.000295 *4*; α(M)=4.60×10^{-5} *7* α(N)=3.92×10^{-6} *6* δ: RUL=300 for E2 suggests δ(E2/M1)<0.7.
		833.8 *5*	100	3853.75	$(8)^+$	[E2]	0.000656 *9*	B(E2)(W.u.)=70 *+14−13* α(K)=0.000584 *8*; α(L)=6.15×10^{-5} *9*; α(M)=9.56×10^{-6} *13* α(N)=8.13×10^{-7} *11*
		1417.7 *5*	83 *4*	3269.75	8^+	E2	0.0002532 *35*	B(E2)(W.u.)=4.1 *+9−6* α(K)=0.0001742 *24*; α(L)=1.808×10^{-5} *25*; α(M)=2.81×10^{-6} *4* α(N)=2.404×10^{-7} *34*; α(IPF)=5.79×10^{-5} *8*
4720.6	1^-	4161.3 *6*	100 *10*	559.103	2^+	E1	1.75×10^{-3} *3*	B(E1)(W.u.)=4.9×10^{-4} *+9−7* α(K)=1.841×10^{-5} *26*; α(L)=1.877×10^{-6} *26*; α(M)=2.92×10^{-7} *4* α(N)=2.505×10^{-8} *35*; α(IPF)=0.001732 *24*
		4720.5 *7*	66 *8*	0.0	0^+	E1	1.94×10^{-3} *3*	B(E1)(W.u.)=2.22×10^{-4} *+43−34* α(K)=1.574×10^{-5} *22*; α(L)=1.605×10^{-6} *22*; α(M)=2.494×10^{-7} *35* α(N)=2.141×10^{-8} *30*; α(IPF)=0.001924 *27*

$^{76}_{34}Se_{42}$-48

$\gamma(^{76}$Se) (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	α†	Comments
4723.2	(3^+)	1772.95 *59*	100 *8*	2950.171	1^+			
		3507.05 *54*	86 *12*	1216.154	2^+			
		4163.45 *98*	80 *8*	559.103	2^+			
4728.6		1287.0 *5*	100	3441.54	7^-			
4731.6	$(^+)$	1781.37 *40*	100 *6*	2950.171	1^+			
		3515.7 *11*	46 *6*	1216.154	2^+			
4766.96	1	4766.8 *3*	100	0.0	0^+	D		If M1, B(M1)(W.u.)=0.0117 *10*. If E1, B(E1)(W.u.)=0.000200 *18*.
4794.97	(1,2)	1982.95 *56*	36 *9*	2812.130	(3^+)			
		2139.93 *26*	60.4 *27*	2655.383	1			
		2365.29 *27*	100 *15*	2429.131	3^-			
		3672.54 *22*	19.5 *14*	1122.279	0^+			
		4235.89 *41*	53 *4*	559.103	2^+			
		4794.96 *40*	8.7 *7*	0.0	0^+			
4880.0	1^-	4879.8 *4*	100	0.0	0^+	E1	1.99×10^{-3} *3*	B(E1)(W.u.)=1.64×10^{-4} *+18−15* α(K)=1.512×10^{-5} *21*; α(L)=1.540×10^{-6} *22*; α(M)=2.394×10^{-7} *34* α(N)=2.056×10^{-8} *29*; α(IPF)=0.001976 *28*
4887.07	1^-	4886.9 *3*	100	0.0	0^+	E1	2.00×10^{-3} *3*	B(E1)(W.u.)=1.19×10^{-4} *+17−13* α(K)=1.509×10^{-5} *21*; α(L)=1.538×10^{-6} *22*; α(M)=2.390×10^{-7} *33* α(N)=2.052×10^{-8} *29*; α(IPF)=0.001978 *28*
4931.6	1^-	4931.4 *17*	100	0.0	0^+	E1	2.01×10^{-3} *3*	B(E1)(W.u.)=4.0×10^{-5} *+14−9* α(K)=1.492×10^{-5} *21*; α(L)=1.521×10^{-6} *21*; α(M)=2.364×10^{-7} *33* α(N)=2.029×10^{-8} *28*; α(IPF)=0.001993 *28*
4938.6	1	4938.4 *15*	100 *10*	0.0	0^+	D		If M1, B(M1)(W.u.)=0.0043 *8*. If E1, B(E1)(W.u.)=$7.3\times10_5$ *14*.
4971.5	1^+	4971.3 *17*	100	0.0	0^+	(M1)	1.41×10^{-3} *2*	B(M1)(W.u.)=0.0047 *+11−7* α(K)=1.964×10^{-5} *28*; α(L)=2.006×10^{-6} *28*; α(M)=3.12×10^{-7} *4* α(N)=2.68×10^{-8} *4*; α(IPF)=0.001390 *19*
4984.81	1^-	4426.1 *5*	73 *12*	559.103	2^+	(E1)	1.85×10^{-3} *3*	B(E1)(W.u.)=3.1×10^{-4} *+6−5* α(K)=1.705×10^{-5} *24*; α(L)=1.738×10^{-6} *24*; α(M)=2.70×10^{-7} *4* α(N)=2.319×10^{-8} *32*; α(IPF)=0.001829 *26*
		4984.3 *4*	100 *9*	0.0	0^+	E1	2.03×10^{-3} *3*	B(E1)(W.u.)=2.9×10^{-4} *+5−4* α(K)=1.473×10^{-5} *21*; α(L)=1.501×10^{-6} *21*; α(M)=2.333×10^{-7} *33* α(N)=2.003×10^{-8} *28*; α(IPF)=0.002011 *28*
5001.48	1^-	5001.3 *2*	100	0.0	0^+	E1	2.03×10^{-3} *3*	B(E1)(W.u.)=3.58×10^{-4} *+27−24* α(K)=1.467×10^{-5} *21*; α(L)=1.495×10^{-6} *21*; α(M)=2.323×10^{-7} *33* α(N)=1.995×10^{-8} *28*; α(IPF)=0.002016 *28*
5010.76	1^-	4451.8 *3*	36 *6*	559.103	2^+	(E1)	1.86×10^{-3} *3*	B(E1)(W.u.)=3.1×10^{-4} *5* α(K)=1.692×10^{-5} *24*; α(L)=1.725×10^{-6} *24*; α(M)=2.68×10^{-7} *4* α(N)=2.302×10^{-8} *32*; α(IPF)=0.001838 *26*
		5010.3 *3*	100 *7*	0.0	0^+	E1	2.04×10^{-3} *3*	B(E1)(W.u.)=6.0×10^{-4} *+7−6*

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	α†	Comments
								α(K)=1.464×10^{-5} *20*; α(L)=1.492×10^{-6} *21*; α(M)=2.318×10^{-7} *32* α(N)=1.990×10^{-8} *28*; α(IPF)=0.002019 *28*
5068.1	(10)$^-$	1059.4 *5*	100	4008.7	(8$^-$)	E2	0.000368 *5*	B(E2)(W.u.)=22 *6* α(K)=0.000328 *5*; α(L)=3.43×10^{-5} *5*; α(M)=5.33×10^{-6} *7* α(N)=4.54×10^{-7} *6*
5074.00	1$^-$	4515.8 *3*	35 *3*	559.103	2$^+$	(E1)	1.88×10^{-3} *3*	B(E1)(W.u.)=4.34×10^{-4} *+48−42* α(K)=1.663×10^{-5} *23*; α(L)=1.695×10^{-6} *24*; α(M)=2.63×10^{-7} *4* α(N)=2.262×10^{-8} *32*; α(IPF)=0.001859 *26*
		5073.7 *1*	100 *7*	0.0	0$^+$	E1	2.06×10^{-3} *3*	B(E1)(W.u.)=8.7×10^{-4} *6* α(K)=1.442×10^{-5} *20*; α(L)=1.469×10^{-6} *21*; α(M)=2.283×10^{-7} *32* α(N)=1.960×10^{-8} *27*; α(IPF)=0.002039 *29*
5122.19	1	5122.0 *2*	100	0.0	0$^+$	D		If M1, B(M1)(W.u.)=0.0047 *11*. If E1, B(E1)(W.u.)=8.0×10$_5$ *19*.
5128.59	1	5128.4 *1*	100	0.0	0$^+$	D		If M1, B(M1)(W.u.)=0.0065 *11*. IF E1, BE1W=0.000112 *18*.
5142.3	1	5142.1 *7*	100	0.0	0$^+$	D		If M1, B(M1)(W.u.)=0.0062 *8*. If E1, B(E1)(W.u.)=0.000106 *13*.
5195.00	1$^-$	4635.1 *3*	67 *6*	559.103	2$^+$	(E1)	1.91×10^{-3} *3*	B(E1)(W.u.)=6.7×10^{-4} *7* α(K)=1.610×10^{-5} *23*; α(L)=1.641×10^{-6} *23*; α(M)=2.55×10^{-7} *4* α(N)=2.190×10^{-8} *31*; α(IPF)=0.001897 *27*
		5194.5 *3*	100 *7*	0.0	0$^+$	E1	2.09×10^{-3} *3*	B(E1)(W.u.)=7.1×10^{-4} *+7−6* α(K)=1.401×10^{-5} *20*; α(L)=1.427×10^{-6} *20*; α(M)=2.219×10^{-7} *31* α(N)=1.905×10^{-8} *27*; α(IPF)=0.002074 *29*
5217.8	1$^-$	5217.6 *11*	100	0.0	0$^+$	E1	2.10×10^{-3} *3*	B(E1)(W.u.)=2.2×10^{-4} *+6−4* α(K)=1.394×10^{-5} *20*; α(L)=1.420×10^{-6} *20*; α(M)=2.207×10^{-7} *31* α(N)=1.895×10^{-8} *27*; α(IPF)=0.002081 *29*
5239.6	1	4023.1 *10*	28 *6*	1216.154	2$^+$			
		5239.7 *12*	100 *18*	0.0	0$^+$	D		If M1, B(M1)(W.u.)=0.012 *4*. If E1, B(E1)(W.u.)=0.00021 *6*.
5284.40	1	5284.2 *3*	100	0.0	0$^+$	D		If M1, B(M1)(W.u.)=0.0178 *13*. If E1, B(E1)(W.u.)=0.000304 *22*.
5297.90	(1$^+$)	5297.7 *3*	100	0.0	0$^+$	(M1)	1.50×10^{-3} *2*	B(M1)(W.u.)=0.0108 *6* α(K)=1.788×10^{-5} *25*; α(L)=1.826×10^{-6} *26*; α(M)=2.84×10^{-7} *4* α(N)=2.440×10^{-8} *34*; α(IPF)=0.001481 *21*
5298.60	1$^-$	4175.0@ *12*	3.9 *9*	1122.279	0$^+$	(E1)	1.76×10^{-3} *3*	B(E1)(W.u.)=8.6×10^{-5} *20* α(K)=1.834×10^{-5} *26*; α(L)=1.870×10^{-6} *26*; α(M)=2.91×10^{-7} *4* α(N)=2.495×10^{-8} *35*; α(IPF)=0.001737 *24*
		4739.6@ *5*	15.1 *16*	559.103	2$^+$	(E1)	1.95×10^{-3} *3*	B(E1)(W.u.)=2.26×10^{-4} *+28−26* α(K)=1.567×10^{-5} *22*; α(L)=1.597×10^{-6} *22*; α(M)=2.482×10^{-7} *35* α(N)=2.131×10^{-8} *30*; α(IPF)=0.001930 *27*
		5298.4 *1*	100 *6*	0.0	0$^+$	E1	2.12×10^{-3} *3*	B(E1)(W.u.)=0.00108 *7* α(K)=1.368×10^{-5} *19*; α(L)=1.394×10^{-6} *20*; α(M)=2.166×10^{-7} *30* α(N)=1.860×10^{-8} *26*; α(IPF)=0.002102 *29*

$^{76}_{34}Se_{42}$-50

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Mult. #	α †	Comments
5324.18	1^-	4766.9 *10*	67 *10*	559.103	2^+	[E1]	1.96×10^{-3} *3*	B(E1)(W.u.)=4.5×10^{-4} *7* α(K)=1.556×10^{-5} *22*; α(L)=1.585×10^{-6} *22*; α(M)=2.464×10^{-7} *35* α(N)=2.116×10^{-8} *30*; α(IPF)=0.001938 *27*
		5323.8 *3*	100 *10*	0.0	0^+	E1	2.12×10^{-3} *3*	B(E1)(W.u.)=4.8×10^{-4} *+7−6* α(K)=1.360×10^{-5} *19*; α(L)=1.386×10^{-6} *19*; α(M)=2.154×10^{-7} *30* α(N)=1.849×10^{-8} *26*; α(IPF)=0.002109 *30*
5346.94	1^-	4131.5 *9*	38 *6*	1216.154	2^+	(E1)	1.74×10^{-3} *2*	B(E1)(W.u.)=3.3×10^{-4} *+7−6* α(K)=1.858×10^{-5} *26*; α(L)=1.895×10^{-6} *27*; α(M)=2.94×10^{-7} *4* α(N)=2.528×10^{-8} *35*; α(IPF)=0.001722 *24*
		4788.0 *3*	43 *6*	559.103	2^+	(E1)	1.96×10^{-3} *3*	B(E1)(W.u.)=2.40×10^{-4} *+45−39* α(K)=1.547×10^{-5} *22*; α(L)=1.577×10^{-6} *22*; α(M)=2.451×10^{-7} *34* α(N)=2.104×10^{-8} *29*; α(IPF)=0.001945 *27*
		5346.0 *4*	100 *9*	0.0	0^+	E1	2.13×10^{-3} *3*	B(E1)(W.u.)=4.0×10^{-4} *+6−5* α(K)=1.353×10^{-5} *19*; α(L)=1.379×10^{-6} *19*; α(M)=2.143×10^{-7} *30* α(N)=1.840×10^{-8} *26*; α(IPF)=0.002115 *30*
5367.5	1	5367.3 *13*	100	0.0	0^+	D		If M1, B(M1)(W.u.)=0.0032 *8*. If E1, B(E1)(W.u.)=$5.5\times10_5$ *13*.
5368.3	(11^+)	681.4		4687.3	$(10)^+$			
		962.0		4405.9	(9^+)			
		1068.5		4299.5	10^+			
5375.45	1^-	4816.1 *2*	100 *8*	559.103	2^+	(E1)	1.97×10^{-3} *3*	B(E1)(W.u.)=0.00129 *+14−12* α(K)=1.536×10^{-5} *22*; α(L)=1.565×10^{-6} *22*; α(M)=2.433×10^{-7} *34* α(N)=2.089×10^{-8} *29*; α(IPF)=0.001954 *27*
		5375.6 *4*	83 *6*	0.0	0^+	E1	2.14×10^{-3} *3*	B(E1)(W.u.)=7.7×10^{-4} *+9−8* α(K)=1.344×10^{-5} *19*; α(L)=1.369×10^{-6} *19*; α(M)=2.129×10^{-7} *30* α(N)=1.828×10^{-8} *26*; α(IPF)=0.002122 *30*
5405.2	1^-	5405.0 *18*	100	0.0	0^+	E1	2.15×10^{-3} *3*	B(E1)(W.u.)=9.2×10^{-5} *+40−22* α(K)=1.336×10^{-5} *19*; α(L)=1.361×10^{-6} *19*; α(M)=2.115×10^{-7} *30* α(N)=1.816×10^{-8} *25*; α(IPF)=0.002130 *30*
5411.33	1^-	4852.0 *3*	100 *9*	559.103	2^+	(E1)	1.98×10^{-3} *3*	B(E1)(W.u.)=0.00168 *+46−32* α(K)=1.522×10^{-5} *21*; α(L)=1.551×10^{-6} *22*; α(M)=2.411×10^{-7} *34* α(N)=2.070×10^{-8} *29*; α(IPF)=0.001966 *28*
		5412.4 *14*	28 *7*	0.0	0^+	E1	2.15×10^{-3} *3*	B(E1)(W.u.)=3.4×10^{-4} *+12−9* α(K)=1.333×10^{-5} *19*; α(L)=1.358×10^{-6} *19*; α(M)=2.111×10^{-7} *30* α(N)=1.813×10^{-8} *25*; α(IPF)=0.002132 *30*
5425.21	1^-	4865.9 *3*	100 *10*	559.103	2^+	(E1)	1.99×10^{-3} *3*	B(E1)(W.u.)=4.5×10^{-4} *+7−6* α(K)=1.517×10^{-5} *21*; α(L)=1.546×10^{-6} *22*; α(M)=2.403×10^{-7} *34* α(N)=2.063×10^{-8} *29*; α(IPF)=0.001971 *28*
		5425.1 *5*	100 *10*	0.0	0^+	E1	2.15×10^{-3} *3*	B(E1)(W.u.)=3.27×10^{-4} *+48−40*

γ(^{76}Se) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	α†	Comments
								α(K)=1.330×10^{-5} *19*; α(L)=1.354×10^{-6} *19*; α(M)=2.105×10^{-7} *29* α(N)=1.808×10^{-8} *25*; α(IPF)=0.002136 *30*
5431.8	12$^+$	1133.0 *5*	100	4299.5	10$^+$	(E2)	0.000318 *4*	B(E2)(W.u.)=8×10^1 *+7−3* α(K)=0.000282 *4*; α(L)=2.94×10^{-5} *4*; α(M)=4.57×10^{-6} *6* α(N)=3.90×10^{-7} *5*; α(IPF)=1.96×10^{-6} *4*
5551.8	1$^-$	5551.6 *15*	100	0.0	0$^+$	E1	2.19×10^{-3} *3*	B(E1)(W.u.)=2.3×10^{-4} *+8−5* α(K)=1.294×10^{-5} *18*; α(L)=1.317×10^{-6} *18*; α(M)=2.048×10^{-7} *29* α(N)=1.758×10^{-8} *25*; α(IPF)=0.002171 *30*
5629.8	1$^-$	5629.6 *15*	100	0.0	0$^+$	E1	2.21×10^{-3} *3*	B(E1)(W.u.)=8.8×10^{-5} *+42−22* α(K)=1.272×10^{-5} *18*; α(L)=1.296×10^{-6} *18*; α(M)=2.014×10^{-7} *28* α(N)=1.729×10^{-8} *24*; α(IPF)=0.002193 *31*
5637.7	1$^-$	5637.5 *15*	100	0.0	0$^+$	E1	2.21×10^{-3} *3*	B(E1)(W.u.)=8.8×10^{-5} *+44−22* α(K)=1.270×10^{-5} *18*; α(L)=1.293×10^{-6} *18*; α(M)=2.010×10^{-7} *28* α(N)=1.726×10^{-8} *24*; α(IPF)=0.002196 *31*
5669.2	1$^-$	5669.0 *15*	100	0.0	0$^+$	E1	2.22×10^{-3} *3*	B(E1)(W.u.)=9×10^{-5} *+5−3* α(K)=1.262×10^{-5} *18*; α(L)=1.285×10^{-6} *18*; α(M)=1.997×10^{-7} *28* α(N)=1.715×10^{-8} *24*; α(IPF)=0.002205 *31*
5685.5	1$^-$	5685.3 *4*	100	0.0	0$^+$	E1	2.22×10^{-3} *3*	B(E1)(W.u.)=2.56×10^{-4} *+25−21* α(K)=1.257×10^{-5} *18*; α(L)=1.280×10^{-6} *18*; α(M)=1.990×10^{-7} *28* α(N)=1.709×10^{-8} *24*; α(IPF)=0.002209 *31*
5709.8	1$^-$	5709.6 *4*	100	0.0	0$^+$	E1	2.23×10^{-3} *3*	B(E1)(W.u.)=2.73×10^{-4} *+29−23* α(K)=1.251×10^{-5} *18*; α(L)=1.274×10^{-6} *18*; α(M)=1.980×10^{-7} *28* α(N)=1.700×10^{-8} *24*; α(IPF)=0.002216 *31*
5740.73	1$^-$	5740.5 *3*	100	0.0	0$^+$	E1	2.24×10^{-3} *3*	B(E1)(W.u.)=3.55×10^{-4} *+35−29* α(K)=1.243×10^{-5} *17*; α(L)=1.266×10^{-6} *18*; α(M)=1.967×10^{-7} *28* α(N)=1.689×10^{-8} *24*; α(IPF)=0.002224 *31*
5762.0	1$^-$	5761.8 *10*	100	0.0	0$^+$	E1	2.24×10^{-3} *3*	B(E1)(W.u.)=1.25×10^{-4} *+34−23* α(K)=1.237×10^{-5} *17*; α(L)=1.260×10^{-6} *18*; α(M)=1.959×10^{-7} *27* α(N)=1.682×10^{-8} *24*; α(IPF)=0.002230 *31*
5773.3	1$^-$	5773.1 *10*	100	0.0	0$^+$	E1	2.25×10^{-3} *3*	B(E1)(W.u.)=1.09×10^{-4} *+19−14* α(K)=1.235×10^{-5} *17*; α(L)=1.257×10^{-6} *18*; α(M)=1.954×10^{-7} *27* α(N)=1.678×10^{-8} *23*; α(IPF)=0.002233 *31*
5781.24	1$^-$	5781.0 *2*	100	0.0	0$^+$	E1	2.25×10^{-3} *3*	B(E1)(W.u.)=4.94×10^{-4} *+39−34* α(K)=1.233×10^{-5} *17*; α(L)=1.255×10^{-6} *18*; α(M)=1.951×10^{-7} *27* α(N)=1.675×10^{-8} *23*; α(IPF)=0.002235 *31* E_γ: 5783.3 *3* in (γ,γ').
5796.7	(12$^+$)	1109.6		4687.3	(10)$^+$			
		1496.7		4299.5	10$^+$			

γ(^{76}Se) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	α†	Comments
5804.0	1^-	5246.1 *14*	100 *19*	559.103	2^+	(E1)	2.10×10^{-3} *3*	B(E1)(W.u.)=5.7×10^{-4} *+16−12* α(K)=1.385×10^{-5} *19*; α(L)=1.410×10^{-6} *20*; α(M)=2.192×10^{-7} *31* α(N)=1.882×10^{-8} *26*; α(IPF)=0.002088 *29*
		5803.4 *7*	64 *11*	0.0	0^+	E1	2.25×10^{-3} *3*	B(E1)(W.u.)=2.7×10^{-4} *+9−6* α(K)=1.227×10^{-5} *17*; α(L)=1.249×10^{-6} *17*; α(M)=1.942×10^{-7} *27* α(N)=1.668×10^{-8} *23*; α(IPF)=0.002241 *31*
5813.9	1^-	5813.7 *5*	100	0.0	0^+	E1	2.26×10^{-3} *3*	B(E1)(W.u.)=2.39×10^{-4} *+27−22* α(K)=1.224×10^{-5} *17*; α(L)=1.247×10^{-6} *17*; α(M)=1.938×10^{-7} *27* α(N)=1.664×10^{-8} *23*; α(IPF)=0.002243 *31*
5842.31	1^-	5283.8& *10*	25 *8*	559.103	2^+	[E1]	2.11×10^{-3} *3*	B(E1)(W.u.)=1.7×10^{-4} *5* α(K)=1.373×10^{-5} *19*; α(L)=1.398×10^{-6} *20*; α(M)=2.173×10^{-7} *30* α(N)=1.866×10^{-8} *26*; α(IPF)=0.002098 *29*
		5842.0 *3*	100 *11*	0.0	0^+	E1	2.26×10^{-3} *3*	B(E1)(W.u.)=4.9×10^{-4} *+8−6* α(K)=1.217×10^{-5} *17*; α(L)=1.240×10^{-6} *17*; α(M)=1.927×10^{-7} *27* α(N)=1.654×10^{-8} *23*; α(IPF)=0.002251 *32*
5865.3	1^-	5865.1 *7*	100	0.0	0^+	E1	2.27×10^{-3} *3*	B(E1)(W.u.)=2.45×10^{-4} *+40−31* α(K)=1.212×10^{-5} *17*; α(L)=1.234×10^{-6} *17*; α(M)=1.918×10^{-7} *27* α(N)=1.647×10^{-8} *23*; α(IPF)=0.002256 *32*
5879.6	1^-	5879.4 *6*	100	0.0	0^+	E1	2.27×10^{-3} *3*	B(E1)(W.u.)=1.25×10^{-4} *+18−14* α(K)=1.208×10^{-5} *17*; α(L)=1.230×10^{-6} *17*; α(M)=1.912×10^{-7} *27* α(N)=1.642×10^{-8} *23*; α(IPF)=0.002260 *32*
5892.30	1^-	5333.1 *4*	81 *11*	559.103	2^+	(E1)	2.13×10^{-3} *3*	B(E1)(W.u.)=3.3×10^{-4} *+7−5* α(K)=1.357×10^{-5} *19*; α(L)=1.383×10^{-6} *19*; α(M)=2.149×10^{-7} *30* α(N)=1.845×10^{-8} *26*; α(IPF)=0.002111 *30*
		5891.9 *5*	100 *11*	0.0	0^+	E1	2.28×10^{-3} *3*	B(E1)(W.u.)=3.0×10^{-4} *+6−5* α(K)=1.205×10^{-5} *17*; α(L)=1.227×10^{-6} *17*; α(M)=1.907×10^{-7} *27* α(N)=1.638×10^{-8} *23*; α(IPF)=0.002263 *32*
5996.1	1^-	5435.2 *11*	100 *22*	559.103	2^+	(E1)	2.15×10^{-3} *3*	B(E1)(W.u.)=2.6×10^{-4} *+9−6* α(K)=1.327×10^{-5} *19*; α(L)=1.351×10^{-6} *19*; α(M)=2.101×10^{-7} *29* α(N)=1.804×10^{-8} *25*; α(IPF)=0.002139 *30* E_γ: 5438.0 *4* in (γ,γ') due to very different branching ratio.
		5998.4 *14*	69 *19*	0.0	0^+	E1	2.30×10^{-3} *3*	B(E1)(W.u.)=1.3×10^{-4} *+5−4* α(K)=1.180×10^{-5} *17*; α(L)=1.201×10^{-6} *17*; α(M)=1.867×10^{-7} *26* α(N)=1.603×10^{-8} *22*; α(IPF)=0.002289 *32* I_γ: 21 *5* IN (γ,γ').
6035.4	1^-	5474.6& *13*	52 *11*	559.103	2^+	[E1]	2.16×10^{-3} *3*	B(E1)(W.u.)=3.0×10^{-4} *+8−6* α(K)=1.315×10^{-5} *18*; α(L)=1.340×10^{-6} *19*; α(M)=2.082×10^{-7} *29* α(N)=1.788×10^{-8} *25*; α(IPF)=0.002149 *30*

$^{76}_{34}Se_{42}$-53

Adopted Levels, Gammas (continued)

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
6035.4	1^-	6035.4 *5*	100 *12*	0.0	0^+	E1		B(E1)(W.u.)=4.3×10^{-4} *+9−7*
6099.3	1^-	5540.2 *7*	54 *6*	559.103	2^+	(E1)	2.18×10^{-3} *3*	B(E1)(W.u.)=2.8×10^{-4} *+7−5* α(K)=1.297×10^{-5} *18*; α(L)=1.321×10^{-6} *18*; α(M)=2.053×10^{-7} *29* α(N)=1.763×10^{-8} *25*; α(IPF)=0.002168 *30*
		6098.9 *5*	100 *11*	0.0	0^+	E1		B(E1)(W.u.)=3.9×10^{-4} *+9−6*
6131.5	1^-	6131.2 *6*	100	0.0	0^+	E1		B(E1)(W.u.)=1.42×10^{-4} *+27−19*
6156.6	1^-	6156.3 *14*	100	0.0	0^+	E1		B(E1)(W.u.)=2.9×10^{-5} *+7−5*
6165.1	1^-	6164.8 *11*	100	0.0	0^+	E1		B(E1)(W.u.)=7.7×10^{-5} *+30−17*
6196.2	1^-	6195.9 *11*	100	0.0	0^+	E1		B(E1)(W.u.)=1.59×10^{-4} *+24−18*
6208.7	1^-	6208.4 *15*	100	0.0	0^+	E1		B(E1)(W.u.)=3.2×10^{-4} *+8−5*
6242.7	1^-	6242.4 *6*	100	0.0	0^+	E1		B(E1)(W.u.)=6.0×10^{-4} *+41−18* E_γ: 6247.4 *9* in (γ,γ').
6250.7	1^-	6250.4 *5*	100	0.0	0^+	E1		B(E1)(W.u.)=2.76×10^{-4} *+47−34* E_γ: 6254.0 *9* in (γ,γ').
6297.9	1^-	6297.6 *14*	100	0.0	0^+	E1		B(E1)(W.u.)=1.51×10^{-4} *+27−20*
6315.9	1^-	6315.6 *4*	100	0.0	0^+	E1		B(E1)(W.u.)=4.8×10^{-4} *+7−6*
6336.8	1^-	6336.5 *20*	100	0.0	0^+	E1		B(E1)(W.u.)=3.4×10^{-4} *+30−12*
6342.64	1^-	5783.3[&] *3*	100 *14*	559.103	2^+	[E1]	2.25×10^{-3} *3*	B(E1)(W.u.)=0.0054 *+19−12* α(K)=1.232×10^{-5} *17*; α(L)=1.255×10^{-6} *18*; α(M)=1.950×10^{-7} *27* α(N)=1.674×10^{-8} *23*; α(IPF)=0.002236 *31*
		6342.3 *11*	30 *7*	0.0	0^+	E1		B(E1)(W.u.)=0.00122 *+50−34*
6387.5	1^-	6387.2 *14*	100	0.0	0^+	E1		B(E1)(W.u.)=2.16×10^{-4} *+38−28*
6438.1	1	6437.8 *19*	100	0.0	0^+	D		If M1, B(M1)(W.u.)=0.0098 *23*. If E1, B(E1)(W.u.)=0.00017 *4*.
6449.0	1^-	6448.7 *20*	100	0.0	0^+	E1		B(E1)(W.u.)=2.31×10^{-4} *+43−33*
6497.7	1^-	6497.4 *6*	100	0.0	0^+	E1		B(E1)(W.u.)=3.8×10^{-4} *+23−11*
6500.8	(13^+)	1069.3		5431.8	12^+			
		1132.0		5368.3	(11^+)			
6532.7	1^-	6532.4 *4*	100	0.0	0^+	E1		B(E1)(W.u.)=4.43×10^{-4} *+45−38*
6551.00	1^+	6550.7 *3*	100	0.0	0^+	M1		B(M1)(W.u.)=0.0071 *+15−11*
6562.9	1^-	6562.6 *9*	100	0.0	0^+	E1		B(E1)(W.u.)=1.74×10^{-4} *6*
6570.4	1^-	6570.1 *9*	100	0.0	0^+	E1		B(E1)(W.u.)=2.71×10^{-4} *+38−31*
6596.2	1^-	6595.9 *7*	100	0.0	0^+	E1		B(E1)(W.u.)=2.39×10^{-4} *+35−27*
6608.5	1^-	6608.2 *9*	100	0.0	0^+	E1		B(E1)(W.u.)=2.18×10^{-4} *+33−26*
6631.8	1^-	6071.8 *8*	40 *15*	559.103	2^+	(E1)		B(E1)(W.u.)=3.5×10^{-4} *+15−12*
		6632.9 *12*	100 *23*	0.0	0^+	E1		B(E1)(W.u.)=6.6×10^{-4} *+20−14* E_γ: 6630.8 *4* in (γ,γ').

Adopted Levels, Gammas (continued)

$\gamma(^{76}\mathrm{Se})$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	Comments
6641.3	1^-	6641.0 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=2.3×10^{-4} *+7−4*
6653.7	1^-	6653.4 *14*	100	0.0	0^+	E1	B(E1)(W.u.)=3.9×10^{-4} *+11−7*
6680.0	1^-	6679.7 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=2.07×10^{-4} *+26−22*
6691.5	1^-	6691.2 *8*	100	0.0	0^+	E1	B(E1)(W.u.)=1.27×10^{-4} *+24−18*
6700.3	1^-	6700.0 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=1.5×10^{-4} *+6−3*
6709.0	1^-	6708.7 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=1.4×10^{-4} *+5−3*
6736.2	1^-	6735.9 *15*	100	0.0	0^+	E1	B(E1)(W.u.)=1.4×10^{-4} *+5−3*
6743.31	1^-	6182.8 *7*	30 *5*	559.103	2^+	(E1)	B(E1)(W.u.)=3.3×10^{-4} *+7−6*
		6743.2 *3*	100 *8*	0.0	0^+	E1	B(E1)(W.u.)=8.5×10^{-4} *+13−10*
6749.2	1^-	6190.0 *6*	52 *13*	559.103	2^+	(E1)	B(E1)(W.u.)=4.1×10^{-4} *+12−10*
		6748.7 *5*	100 *18*	0.0	0^+	E1	B(E1)(W.u.)=6.1×10^{-4} *+13−11*
6751.5	(14^+)	1319.8		5431.8	12^+		
6813.9	1^-	6813.6 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=7.5×10^{-5} *+43−21*
6830.2	1^-	6829.9 *15*	100	0.0	0^+	E1	B(E1)(W.u.)=1.43×10^{-4} *+39−26*
6882.7	1^-	6323.4 *6*	86 *24*	559.103	2^+	(E1)	B(E1)(W.u.)=4.5×10^{-4} *+12−11*
		6881.9 *14*	100 *14*	0.0	0^+	E1	B(E1)(W.u.)=4.1×10^{-4} *+12−8*
6908.3	1^-	6908.0 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=7.6×10^{-5} *+27−16*
6913.3	1^+	6913.0 *17*	100	0.0	0^+	M1	B(M1)(W.u.)=0.0048 *+19−11*
6922.2	1^-	6921.9 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=9.0×10^{-5} *+32−18*
6970.3	1^-	6970.0 *5*	100	0.0	0^+	E1	B(E1)(W.u.)=2.8×10^{-4} *+8−5* E_γ: 6973.0 *8* in (γ,γ').
6992.9	1^-	6992.5 *5*	100	0.0	0^+	E1	B(E1)(W.u.)=3.3×10^{-4} *+6−5*
7018.1	1^-	7017.7 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=1.0×10^{-4} *+8−3*
7025.1	1^+	7024.7 *20*	100	0.0	0^+	M1	B(M1)(W.u.)=0.0053 *+26−14*
7047.4	1^+	7047.0 *15*	100	0.0	0^+	M1	B(M1)(W.u.)=0.0045 *+25−12*
7053.1	1^-	7052.7 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=8.6×10^{-5} *+37−20*
7084.5	(14^+)	1287.5		5796.7	(12^+)		
		1653.0		5431.8	12^+		
7093.1	1^-	7092.7 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=9.4×10^{-5} *+34−21*
7101.1	1^-	7100.7 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=9.2×10^{-5} *+40−22*
7110.1	1^+	7109.7 *19*	100	0.0	0^+	M1	B(M1)(W.u.)=0.0061 *+26−14*
7115.5	1^-	6557.2 *16*	100 *37*	559.103	2^+	[E1]	B(E1)(W.u.)=2.4×10^{-4} *+15−9*
		7113.6 *19*	96 *35*	0.0	0^+	E1	B(E1)(W.u.)=1.8×10^{-4} *+11−6*
7128.4	1^-	6570.6 *19*	30 *22*	559.103	2^+	[E1]	B(E1)(W.u.)=3.8×10^{-4} *+31−19*
		7127.3 *13*	100 *30*	0.0	0^+	E1	B(E1)(W.u.)=0.00100 *+37−28*
7156.0	1^-	7155.6 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=1.4×10^{-4} *+5−3*
7168.1	1^-	7167.7 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=8.7×10^{-5} *+36−20*
7195.6	1^-	7195.2 *14*	100	0.0	0^+	E1	B(E1)(W.u.)=1.6×10^{-4} *+7−4*

$^{76}_{34}\mathrm{Se}_{42}$-55

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
7225.6	1^-	7225.2 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=1.7×10^{-4} *+6−4*
7241.6	1^-	7241.2 *7*	100	0.0	0^+	E1	B(E1)(W.u.)=2.21×10^{-4} *+49−34*
7292.8	1^-	7292.4 *15*	100	0.0	0^+	E1	B(E1)(W.u.)=2.4×10^{-4} *+8−5*
7324.6	1^-	7324.2 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=1.16×10^{-4} *+47−26*
7335.0	1^-	7334.6 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=9.3×10^{-5} *+44−23*
7342.2	1^-	7341.8 *14*	100	0.0	0^+	E1	B(E1)(W.u.)=2.1×10^{-4} *+7−4*
7362.2	1^-	7361.8 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=7.9×10^{-5} *+37−20*
7392.6	1^-	7392.2 *8*	100	0.0	0^+	E1	B(E1)(W.u.)=7.2×10^{-5} *+31−17*
7406.0	1^-	6846.0 *17*	45 *29*	559.103	2^+	[E1]	B(E1)(W.u.)=1.5×10^{-4} *+18−8*
		7406.0 *15*	100 *38*	0.0	0^+	E1	B(E1)(W.u.)=2.7×10^{-4} *+23−11*
7427.1	1^-	7426.7 *14*	100	0.0	0^+	E1	B(E1)(W.u.)=2.2×10^{-4} *+8−5*
7455.5	1^-	7455.1 *13*	100	0.0	0^+	E1	B(E1)(W.u.)=2.3×10^{-4} *+12−6*
7464.9	1^-	6905.8 *21*	82 *35*	559.103	2^+	[E1]	B(E1)(W.u.)=2.9×10^{-4} *+18−11*
		7464.3 *18*	100 *36*	0.0	0^+	E1	B(E1)(W.u.)=2.8×10^{-4} *+16−10*
7508.4	1^-	7508.0 *8*	100	0.0	0^+	E1	B(E1)(W.u.)=2.23×10^{-4} *+32−25*
7522.7	1^-	6963.9 *7*	56 *12*	559.103	2^+	(E1)	B(E1)(W.u.)=3.4×10^{-4} *+10−8*
		7521.7 *7*	100 *19*	0.0	0^+	E1	B(E1)(W.u.)=4.8×10^{-4} *+12−9*
7546.9	1^-	7546.5 *6*	100	0.0	0^+	E1	B(E1)(W.u.)=5.4×10^{-4} *+5−4*
7580.5	1^-	7580.1 *16*	100	0.0	0^+	E1	B(E1)(W.u.)=1.04×10^{-4} *+41−23*
7617.2	1^-	7616.8 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=1.55×10^{-4} *+40−27*
7627.8	1^-	7627.4 *15*	100	0.0	0^+	E1	B(E1)(W.u.)=2.1×10^{-4} *+5−3*
7643.3	1^-	7642.9 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=1.13×10^{-4} *+39−23*
7652.9	1^-	7652.5 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=2.05×10^{-4} *+49−34*
7658.71	1^-	7658.3 *2*	100	0.0	0^+	E1	B(E1)(W.u.)=1.31×10^{-4} *+24−18*
7698.3	1^-	7137.0[&] *20*	54 *22*	559.103	2^+	[E1]	B(E1)(W.u.)=3.8×10^{-4} *+20−14*
		7698.2 *9*	100 *25*	0.0	0^+	E1	B(E1)(W.u.)=5.5×10^{-4} *+25−15*
7729.7	1^-	7729.3 *16*	100	0.0	0^+	E1	B(E1)(W.u.)=2.2×10^{-4} *+6−4*
7781.6	1^-	7781.2 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=1.2×10^{-4} *+6−3*
7817.5	1^-	7817.1 *10*	100	0.0	0^+	E1	B(E1)(W.u.)=8.1×10^{-5} *+44−22*
7830.0	1^-	7829.6 *9*	100	0.0	0^+	E1	B(E1)(W.u.)=9×10^{-5} *+6−3*
7846.9	(15^+)	1095.5		6751.5	(14^+)		
		1346.0		6500.8	(13^+)		
7866.1	1^-	7865.7 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=9.3×10^{-5} *+43−23*
7890.9	1^-	7890.5 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=9.8×10^{-5} *+44−25*
7920.1	1^-	7919.7 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=1.5×10^{-4} *+7−4*
7927.6	1^-	7927.2 *17*	100	0.0	0^+	E1	B(E1)(W.u.)=1.4×10^{-4} *+7−4*
7952.1	1^-	7951.6 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=1.1×10^{-4} *+6−3*
7960.4	1^-	7959.9 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=1.3×10^{-4} *+6−3*

$\gamma(^{76}Se)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
7979.0	1^-	7978.5 *8*	100	0.0	0^+	E1	B(E1)(W.u.)=2.5×10^{-4} *+6−4*
8017.9	1^-	8017.4 *23*	100	0.0	0^+	E1	B(E1)(W.u.)=1.1×10^{-4} *+5−3*
8062.5	1^-	8062.0 *22*	100	0.0	0^+	E1	B(E1)(W.u.)=1.3×10^{-4} *+6−3*
8082.7	1^-	7521.3 *25*	100 *58*	559.103	2^+	[E1]	B(E1)(W.u.)=2.1×10^{-4} *+14−9*
		8084.2 *26*	85 *46*	0.0	0^+	E1	B(E1)(W.u.)=1.4×10^{-4} *+11−7*
8107.3	1^-	8106.8 *22*	100	0.0	0^+	E1	B(E1)(W.u.)=1.2×10^{-4} *+6−3*
8132.1	1^-	8131.6 *22*	100	0.0	0^+	E1	B(E1)(W.u.)=1.23×10^{-4} *+50−29*
8154.9	1^-	8154.4 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=1.07×10^{-4} *+42−25*
8170.1	1^-	8169.6 *22*	100	0.0	0^+	E1	B(E1)(W.u.)=1.15×10^{-4} *+45−26*
8198.0	1^-	6982.8 *15*	92 *22*	1216.154	2^+	(E1)	B(E1)(W.u.)=7.0×10^{-4} *+19−15*
		8196.5 *13*	100 *15*	0.0	0^+	E1	B(E1)(W.u.)=4.7×10^{-4} *+13−9*
8210.5	1^-	8210.0 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=1.7×10^{-4} *+6−4*
8222.5	1^-	8222.0 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=2.7×10^{-4} *+9−6*
8251.9	1^-	8251.4 *23*	100	0.0	0^+	E1	B(E1)(W.u.)=5.6×10^{-5} *+37−17*
8268.5	(16^+)	1517.0		6751.5	(14^+)		
8288.5	1^-	8288.0 *23*	100	0.0	0^+	E1	B(E1)(W.u.)=1.8×10^{-4} *+6−4*
8316.7	1^-	8316.2 *22*	100	0.0	0^+	E1	B(E1)(W.u.)=1.1×10^{-4} *+6−3*
8340.7	1^-	8340.2 *10*	100	0.0	0^+	E1	B(E1)(W.u.)=1.5×10^{-4} *+7−3*
8394.9	1^-	8394.4 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=2.55×10^{-4} *+42−31*
8453.5	1^-	8453.0 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=2.2×10^{-4} *+7−5*
8486.5	1^-	8486.0 *18*	100	0.0	0^+	E1	B(E1)(W.u.)=6.8×10^{-4} *+23−14*
8528.1	1^-	7970.8 *6*	100 *28*	559.103	2^+	(E1)	B(E1)(W.u.)=7.9×10^{-4} *+25−19* E_γ: not used in the fitting procedure due to its poor fit. Level-energy difference=7967.4.
		8526.0 *5*	97 *22*	0.0	0^+	E1	B(E1)(W.u.)=6.2×10^{-4} *+22−15*
8539.8	1^-	7979.7 *13*	100 *29*	559.103	2^+	[E1]	B(E1)(W.u.)=4.9×10^{-4} *+15−12*
		8540.4 *20*	61 *24*	0.0	0^+	E1	B(E1)(W.u.)=2.4×10^{-4} *+10−8*
8571.7	1^-	8571.2 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=3.5×10^{-4} *+15−8*
8573.8	(16^+)	1489.3		7084.5	(14^+)		
8590.1	1^-	8589.6 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=2.6×10^{-4} *+14−7*
8654.9	1^-	8654.4 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=2.9×10^{-4} *+13−7*
8709.9	1^-	8709.4 *13*	100	0.0	0^+	E1	B(E1)(W.u.)=3.4×10^{-4} *+7−5*
8719.5	1^-	8719.0 *21*	100	0.0	0^+	E1	B(E1)(W.u.)=1.9×10^{-4} *+10−5*
8770.9	1^-	8770.4 *23*	100	0.0	0^+	E1	B(E1)(W.u.)=2.9×10^{-4} *+14−7*
8843.4	1^-	8283.3 *20*	47 *29*	559.103	2^+	[E1]	B(E1)(W.u.)=2.6×10^{-4} *+28−13*
		8843.2 *18*	100 *38*	0.0	0^+	E1	B(E1)(W.u.)=4.5×10^{-4} *+40−18*
8864.8	1^-	8864.2 *20*	100	0.0	0^+	E1	B(E1)(W.u.)=1.9×10^{-4} *+9−5*
8890.8	1^-	8890.2 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=2.6×10^{-4} *+10−6*
8918.8	1^-	8918.2 *19*	100	0.0	0^+	E1	B(E1)(W.u.)=2.5×10^{-4} *+10−6*

$^{76}_{34}Se_{42}$-57

γ(^{76}Se) (continued)

E$_i$(level)	J$^\pi_i$	E$_\gamma$[‡]	I$_\gamma$[‡]	E$_f$	J$^\pi_f$	Mult.[#]	Comments
8935.6	1$^-$	8935.0 *20*	100	0.0	0$^+$	E1	B(E1)(W.u.)=2.0×10^{-4} *+9−5*
9394.7	(17$^+$)	1547.8		7846.9	(15$^+$)		
9963.8	(18$^+$)	1695.3		8268.5	(16$^+$)		
11147.1	(19$^+$)	1752.4		9394.7	(17$^+$)		
(11154.19)	2$^+$,3$^+$	8284.0 *5*	4.1 *3*	2869.34	(1$^+$,2$^+$)		
		8293.2 *5*	3.8 *3*	2859.781	4$^-$		
		8336.5 *5*	8.0 *9*	2817.24	(2$^+$)		
		8341.8 *5*	8.1 *9*	2812.130	(3$^+$)		
		8483.7 *4*	11.2 *6*	2669.904	2$^-$		
		8639.6 *10*	0.61 *11*	2514.681	2$^+$		
		8724.4 *5*	100 *5*	2429.131	3$^-$		
		9027.4 *13*	0.40 *10*	2127.224	(2)$^+$		
		9127.3 *7*	2.45 *16*	2026.020	4$^+$		
		9365.9 *9*	2.07 *14*	1787.655	2$^+$		
		9464.9 *9*	2.06 *14*	1688.971	3$^+$		
		9937.5 *14*	4.7 *4*	1216.154	2$^+$		
		10031.5 *16*	1.22 *10*	1122.279	0$^+$		
		10594.5 *25*	16.0 *9*	559.103	2$^+$		
		11153.0 *40*	1.01 *11*	0.0	0$^+$		
11774.8	(20$^+$)	1810.9		9963.8	(18$^+$)		
13681.3	(22$^+$)	1906.5		11774.8	(20$^+$)		

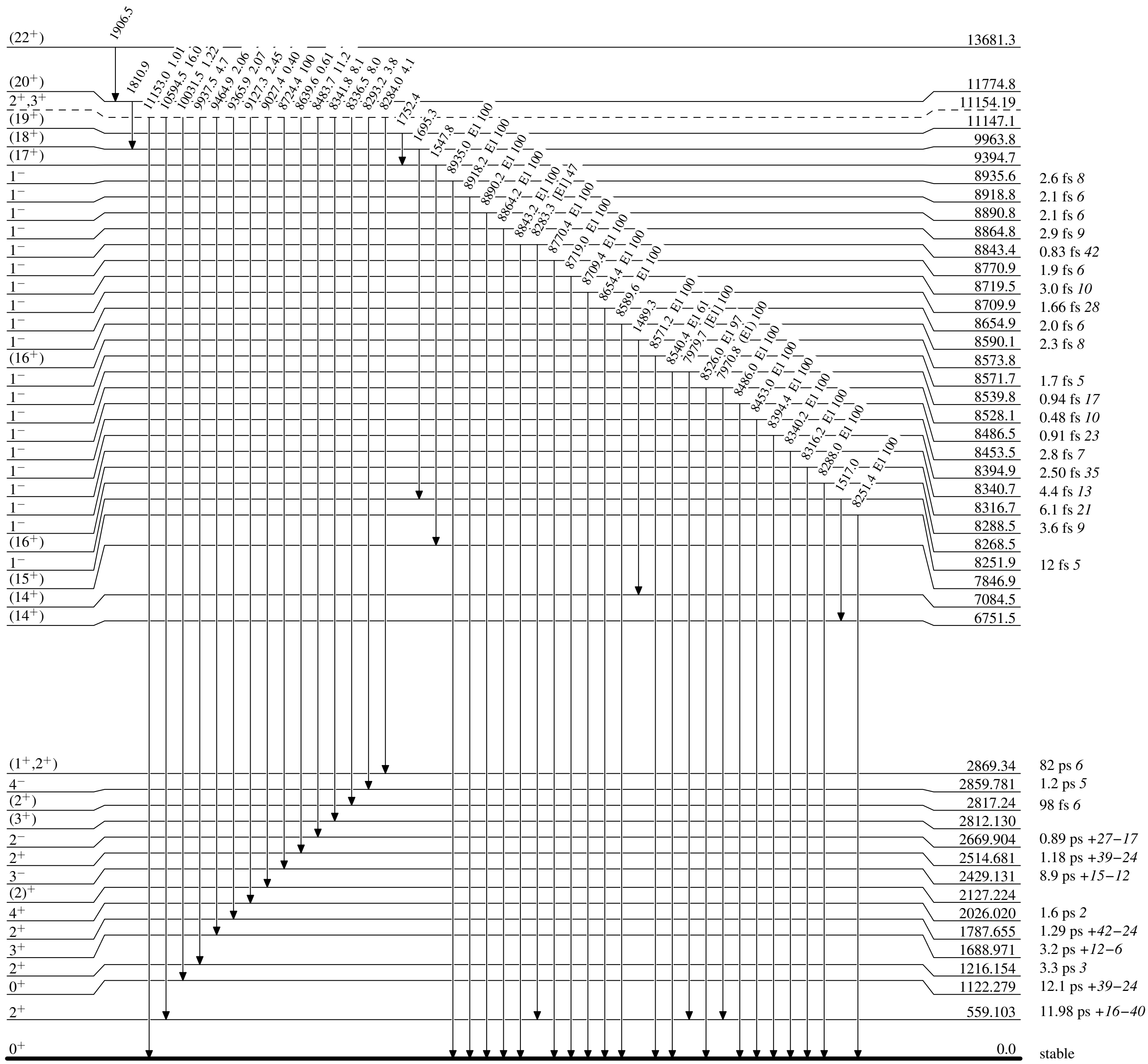
[†] Additional information 4.
[‡] Weighted average of available values from various γ-ray studies.
[#] From $\gamma(\theta)$, $\gamma\gamma(\theta)$, γ(lin pol) in (α,2nγ), ^{76}As β^- and some data in ^{76}Br ε decay, unless otherwise noted.
[@] The γ from (γ,γ'); not given in (pol γ,γ').
[&] The γ from (pol γ,γ'); not given in (γ,γ').
[a] Multiply placed.
[b] Placement of transition in the level scheme is uncertain.

$^{76}_{34}$Se$_{42}$-58

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

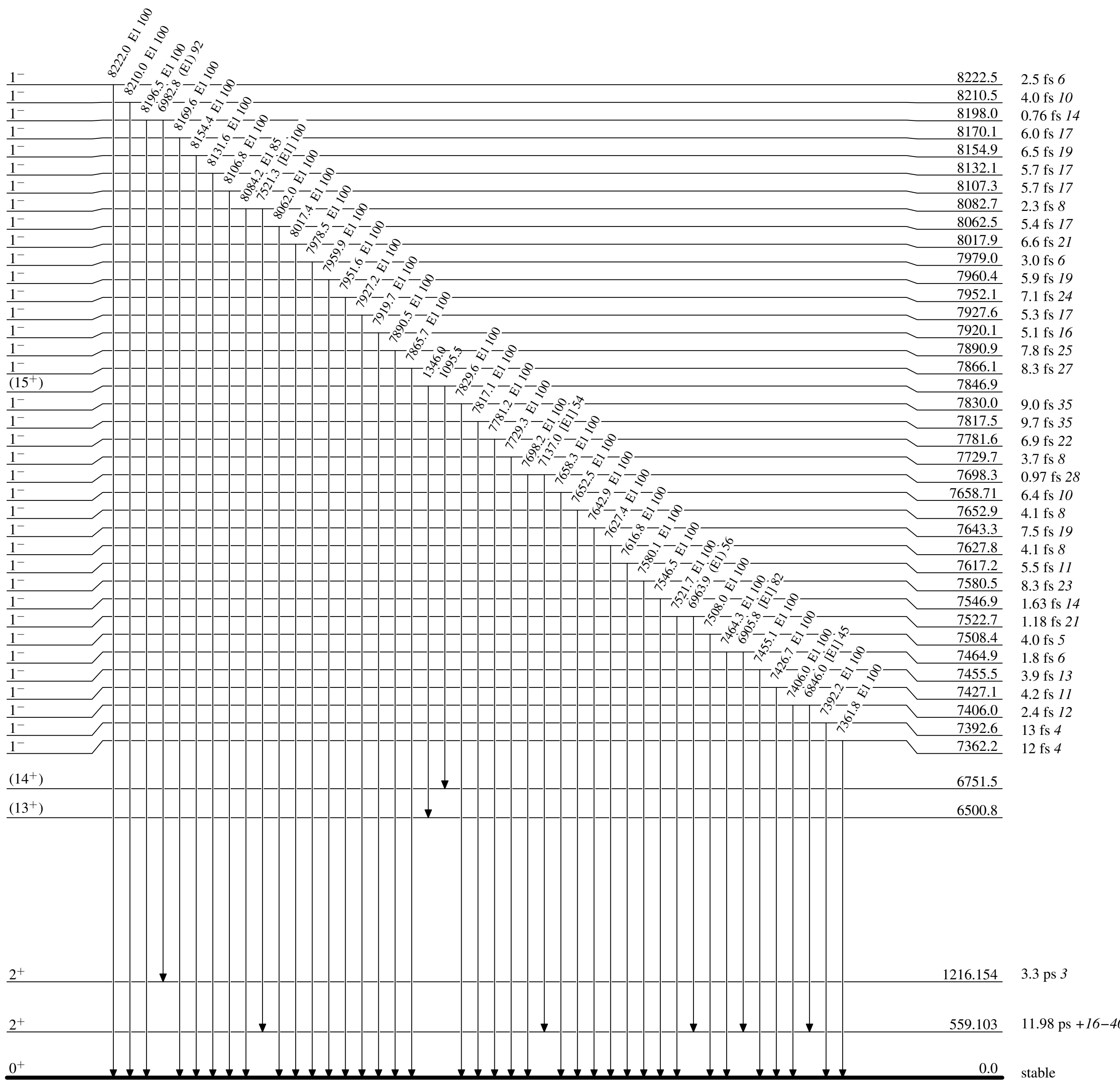


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

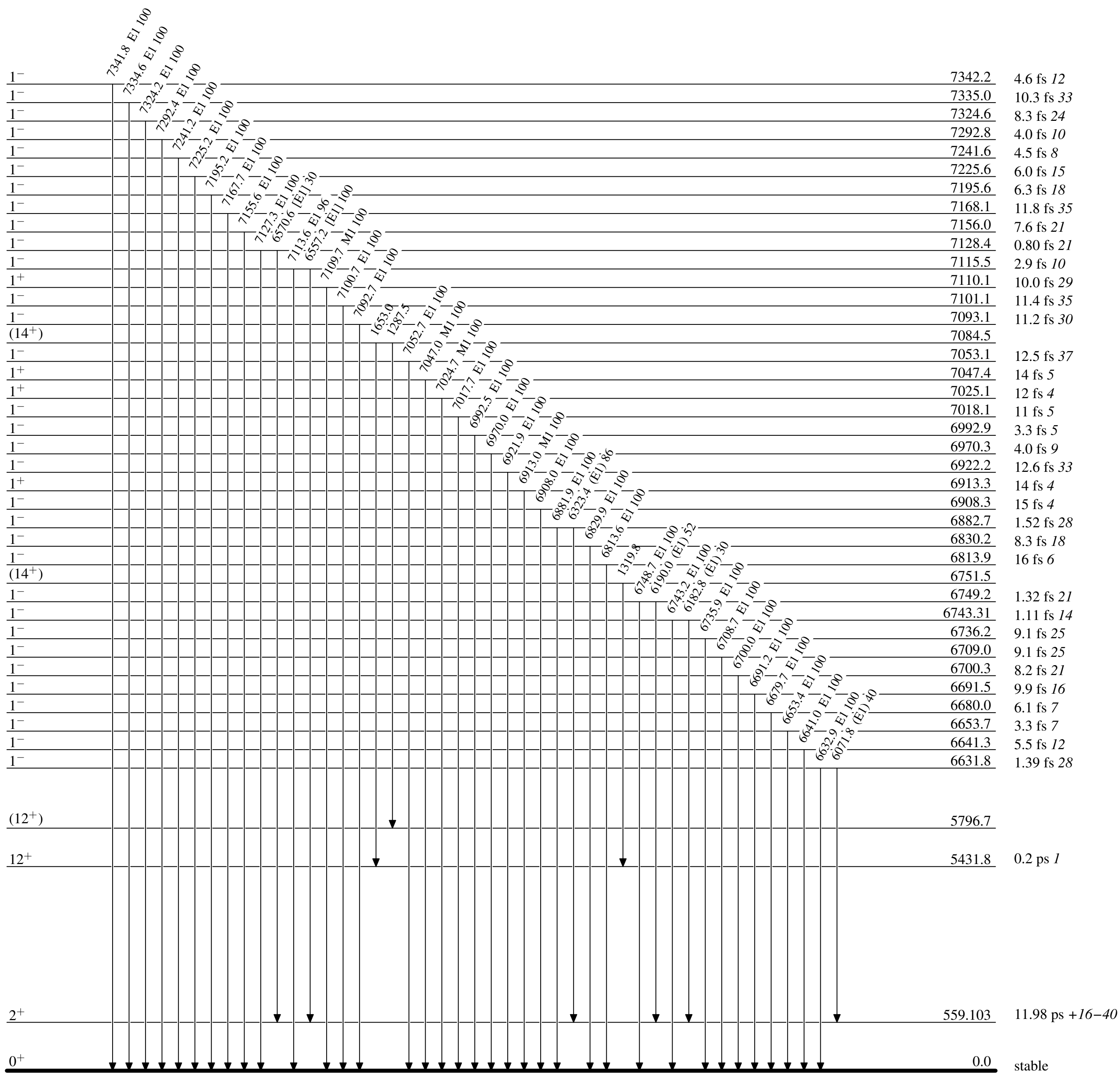


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

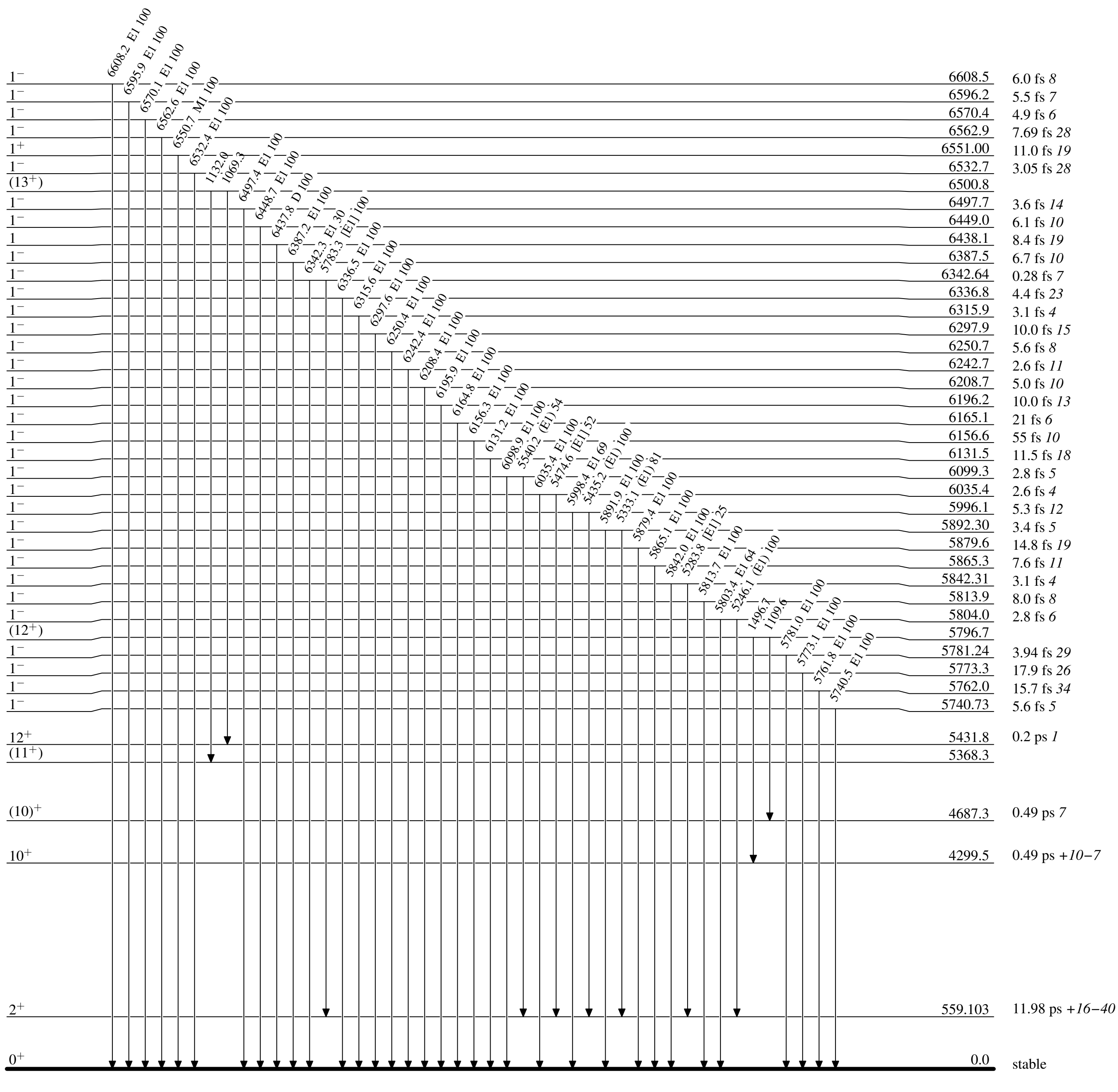


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

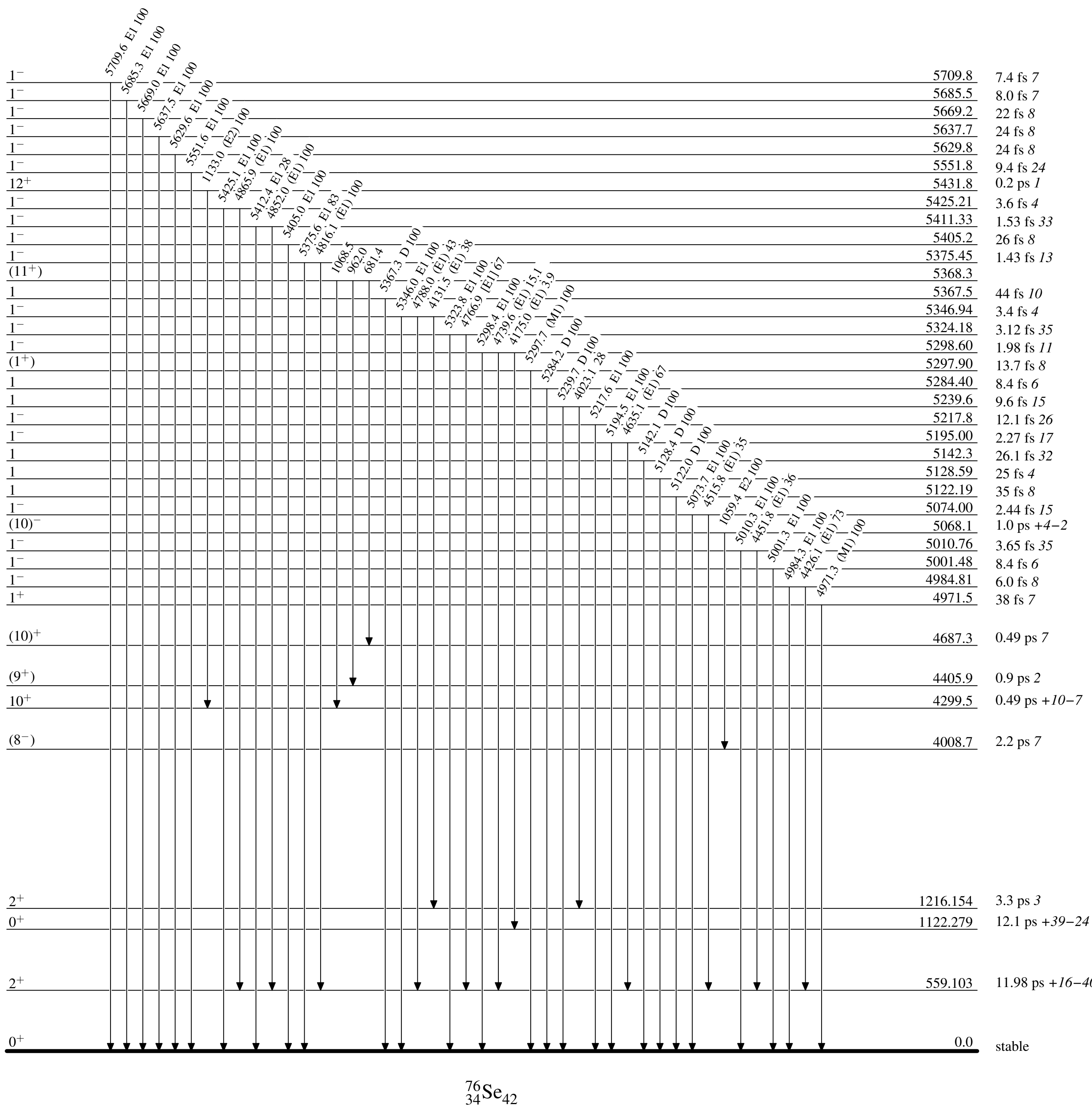
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

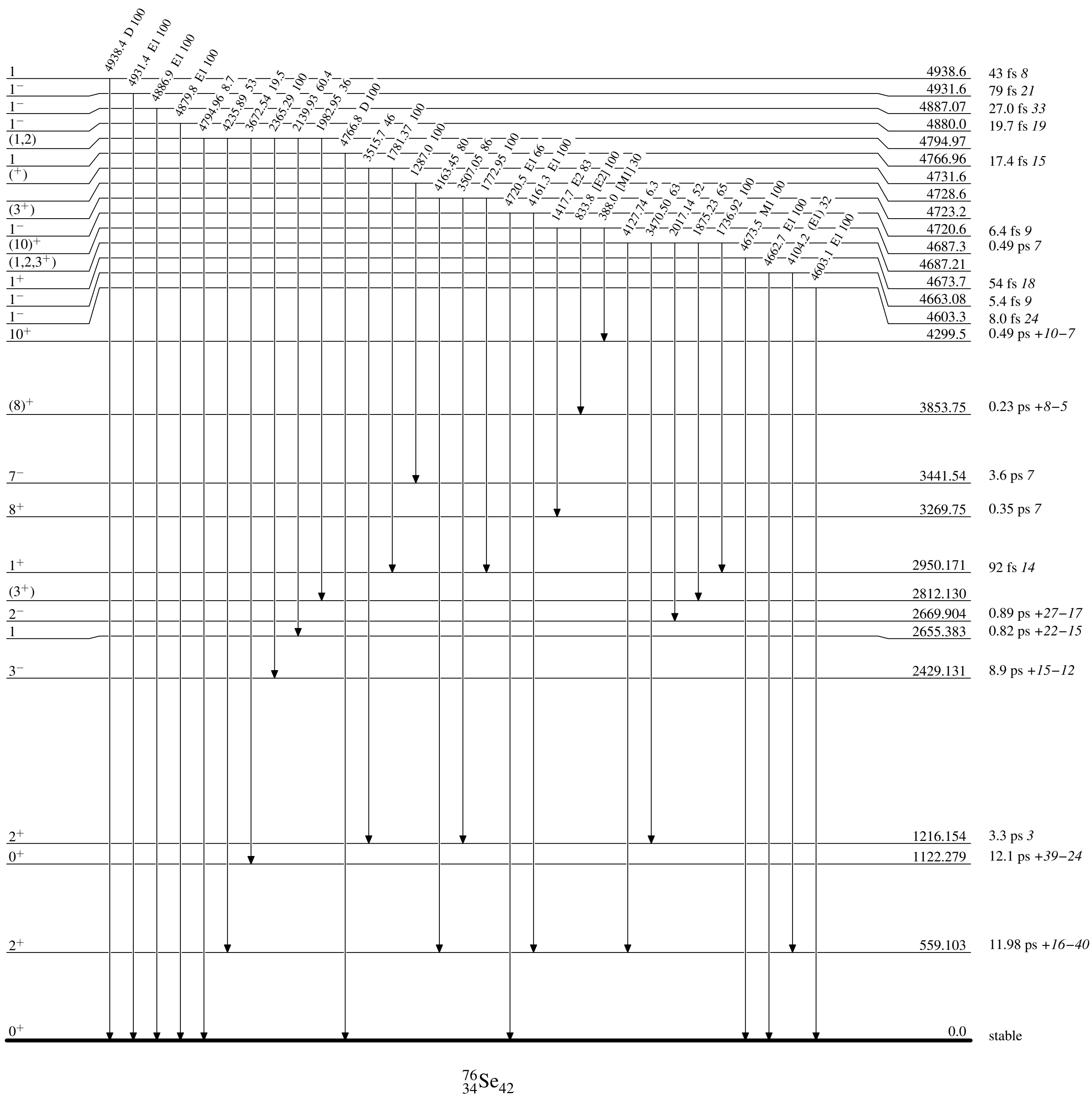
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

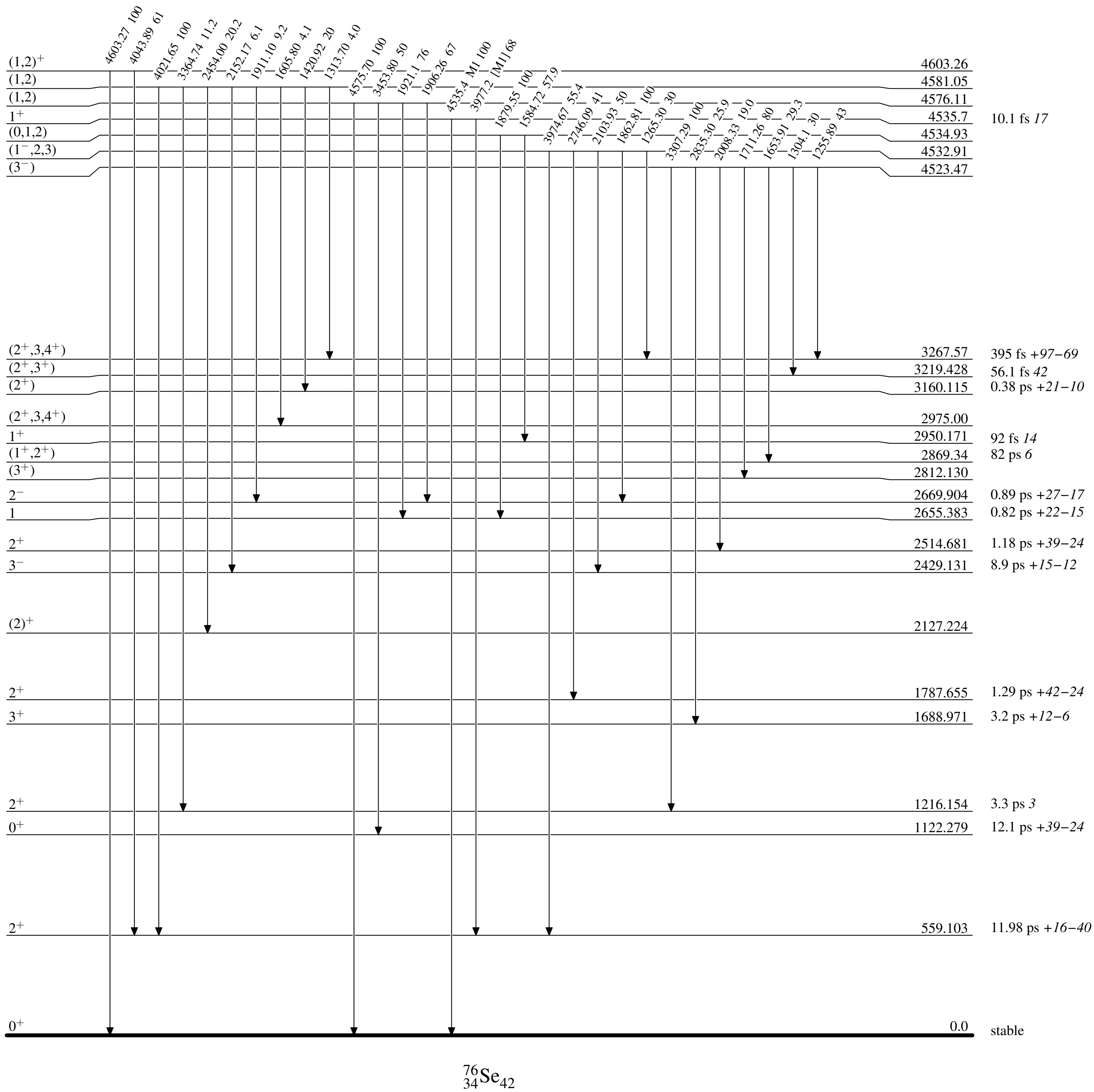
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

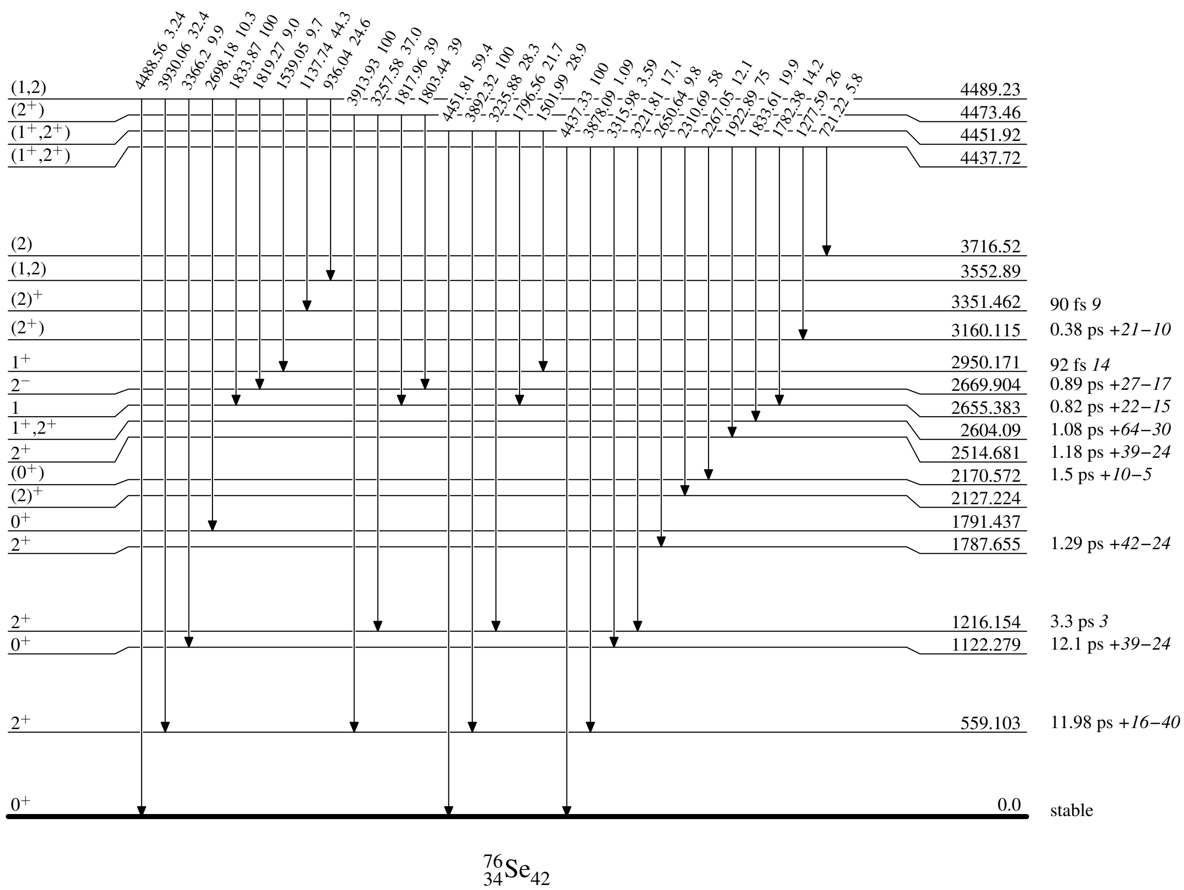
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

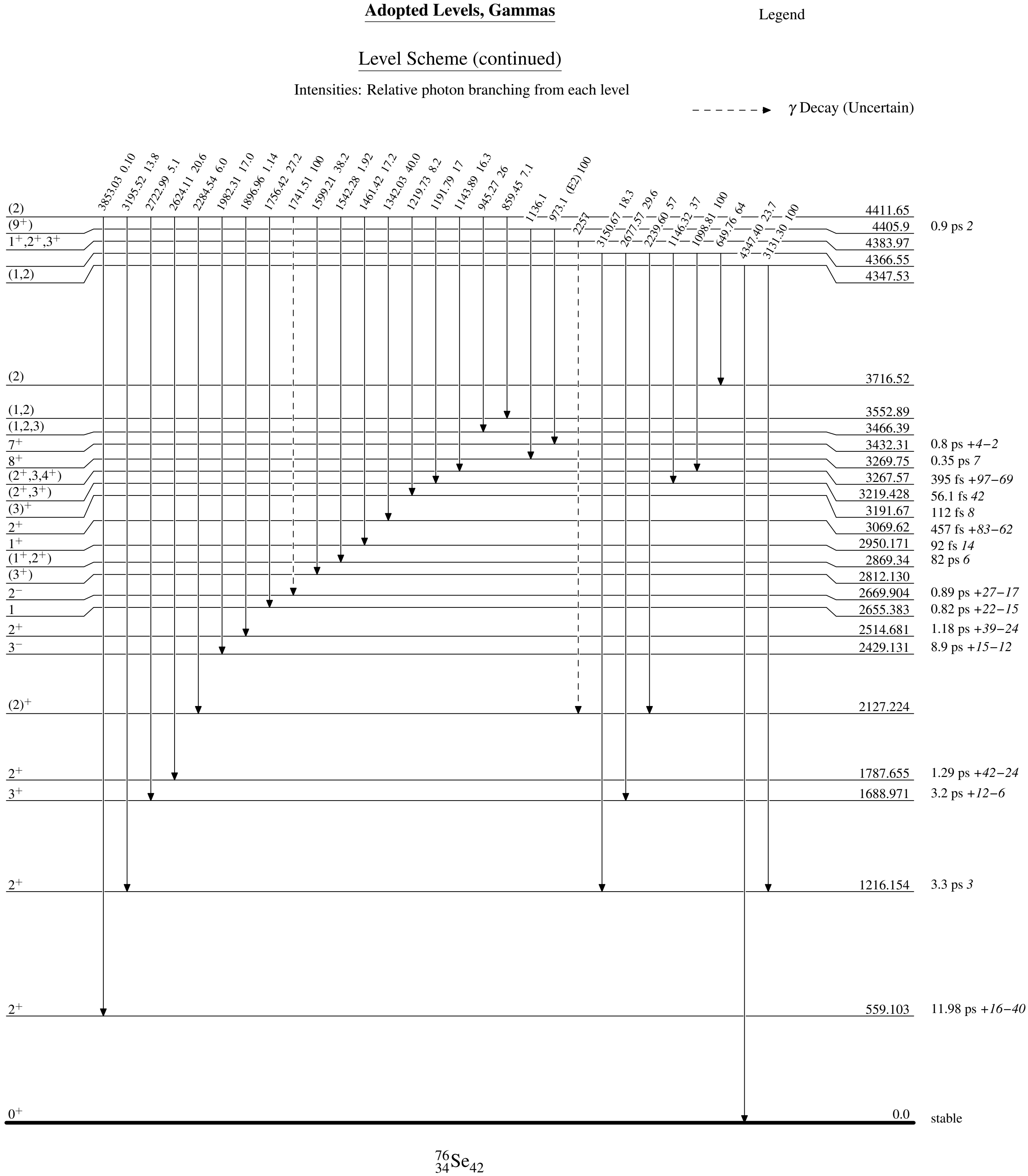
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

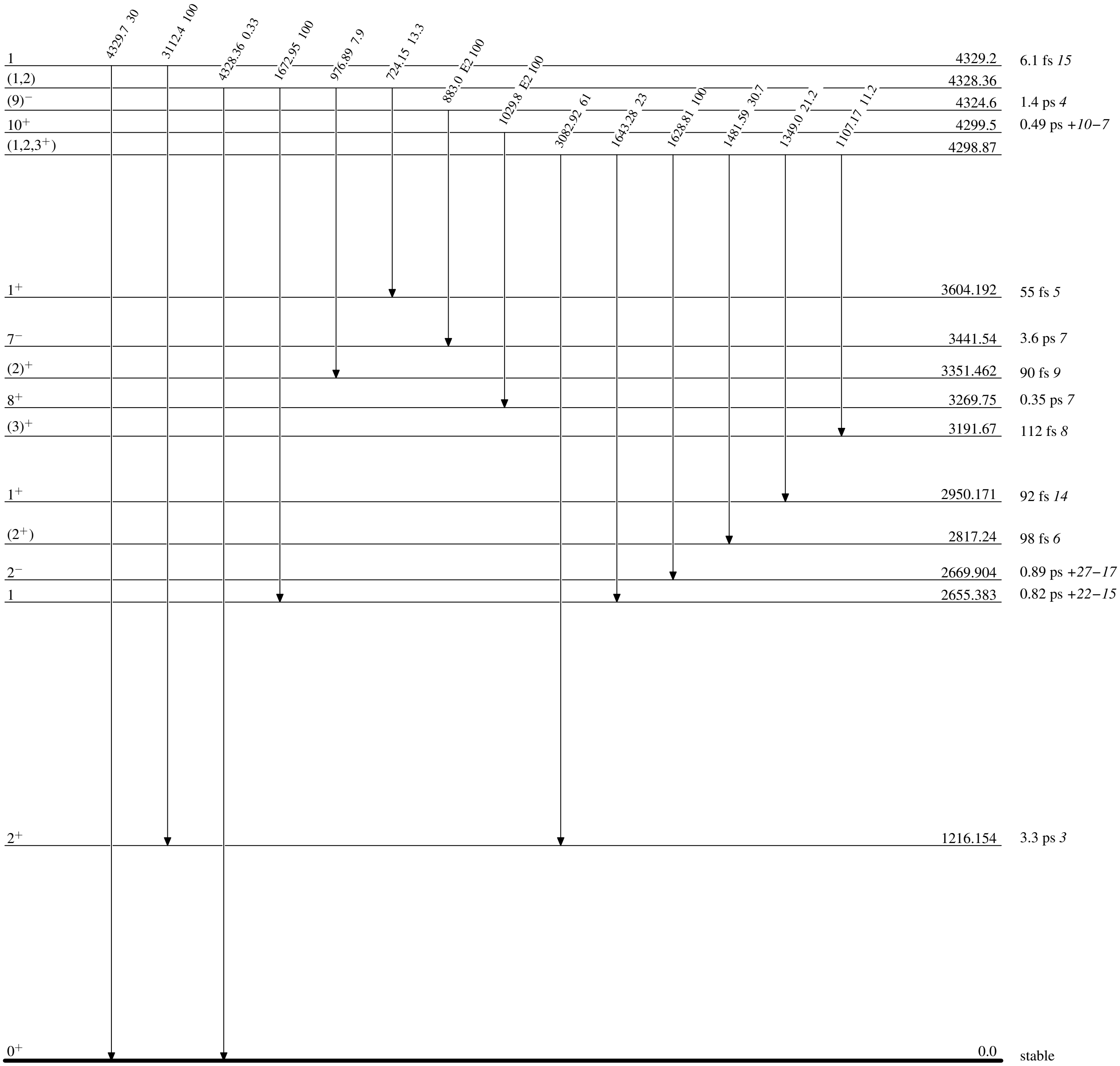
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

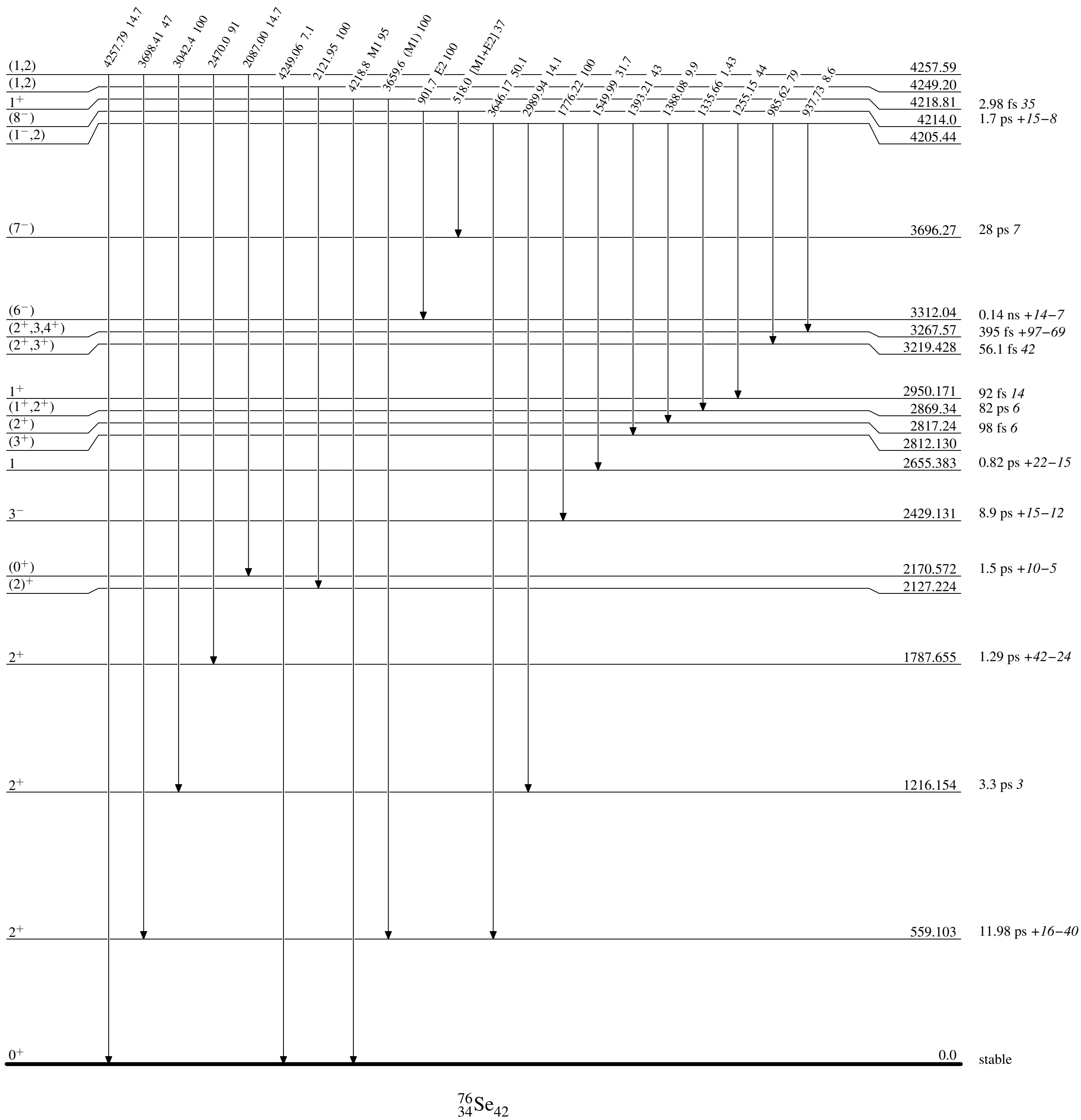


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

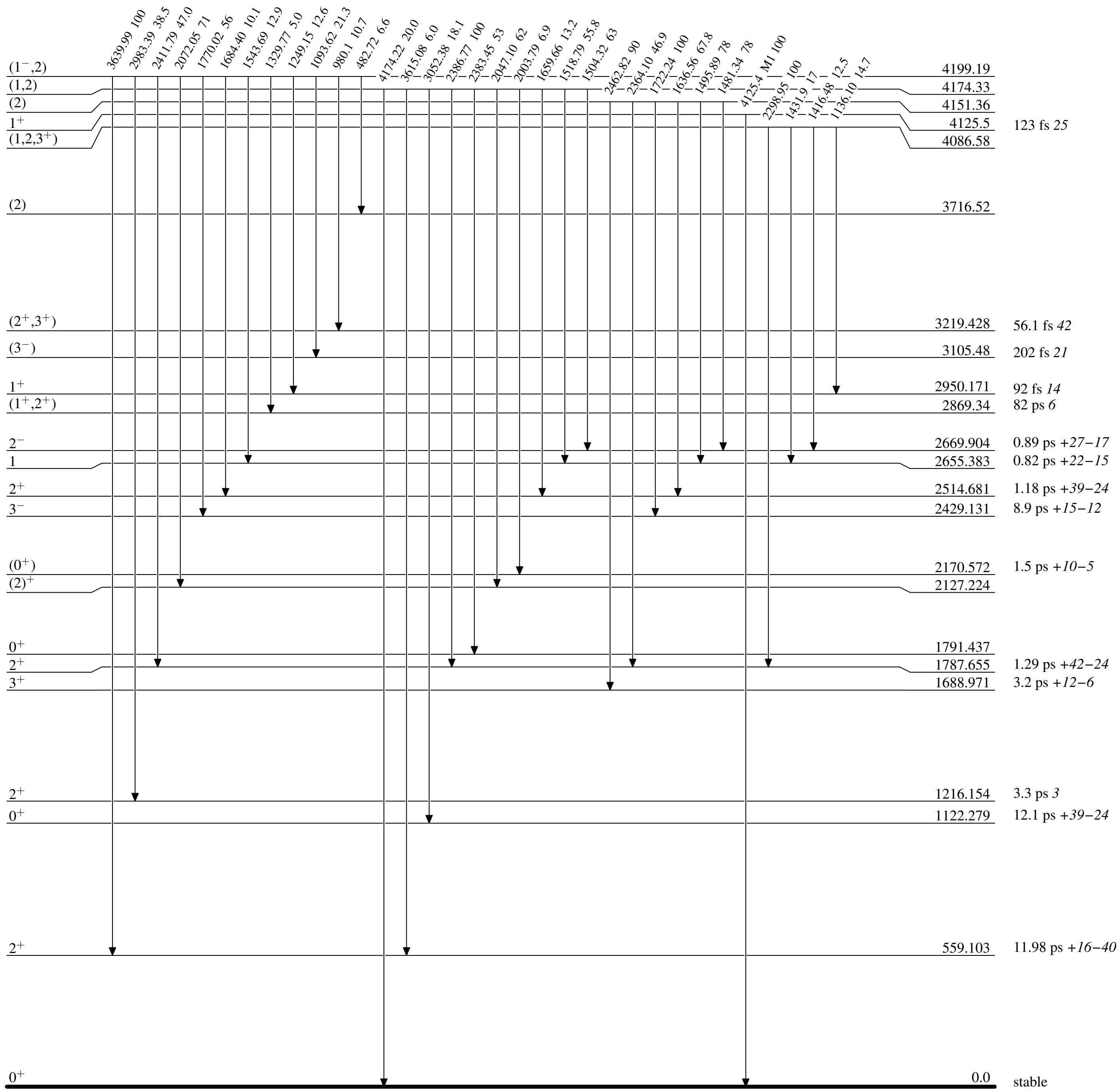
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

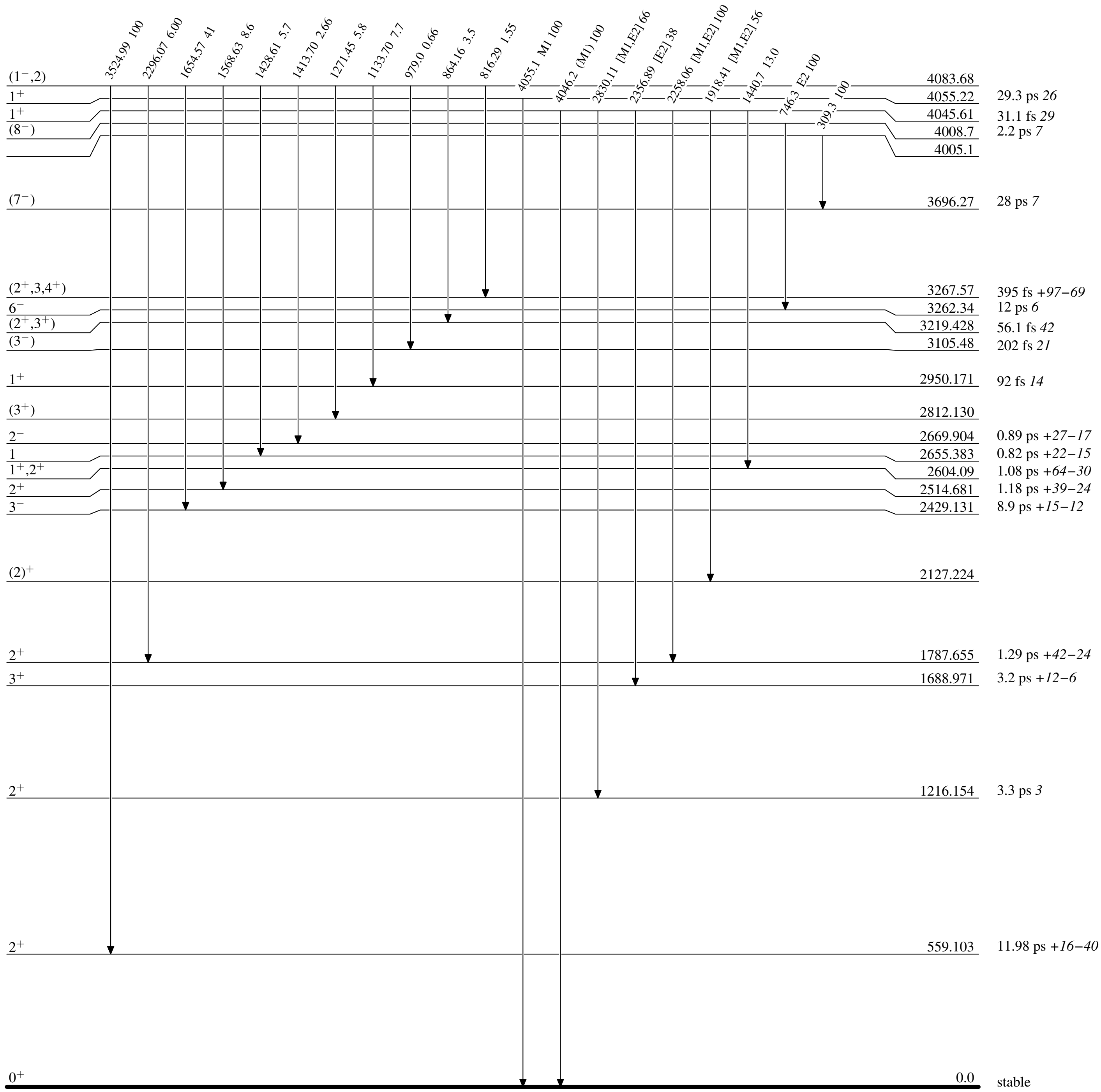


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

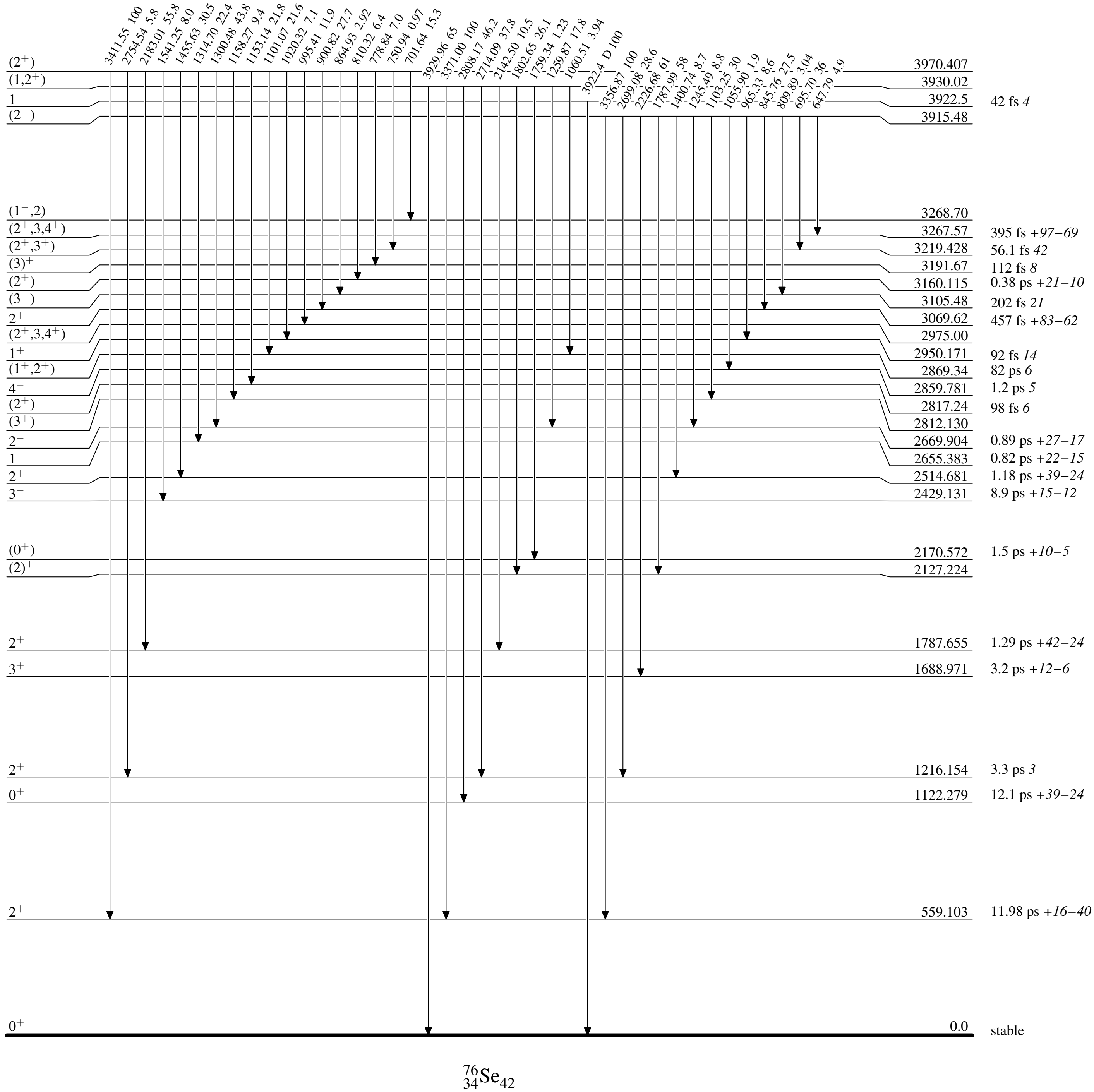


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

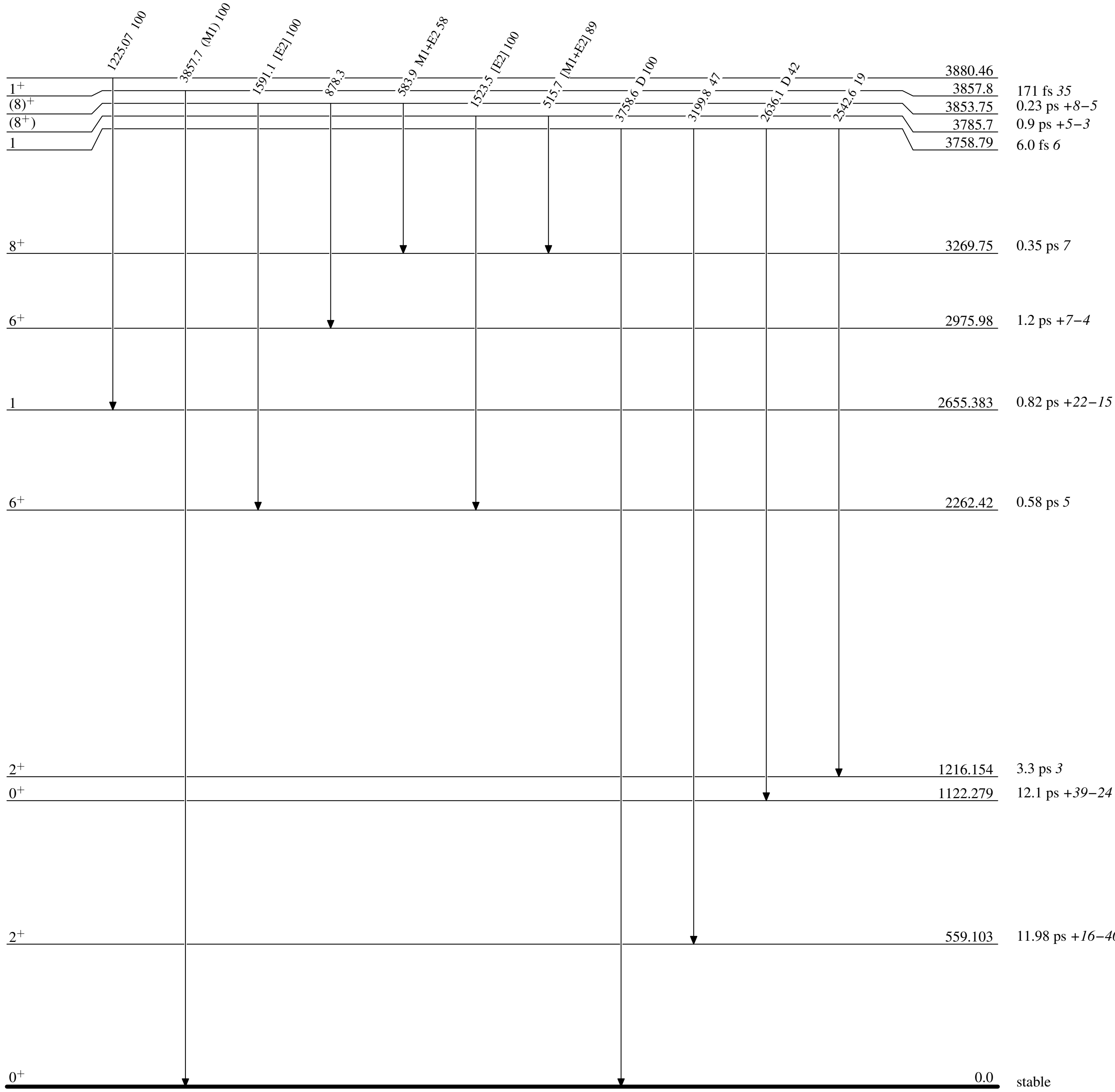
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

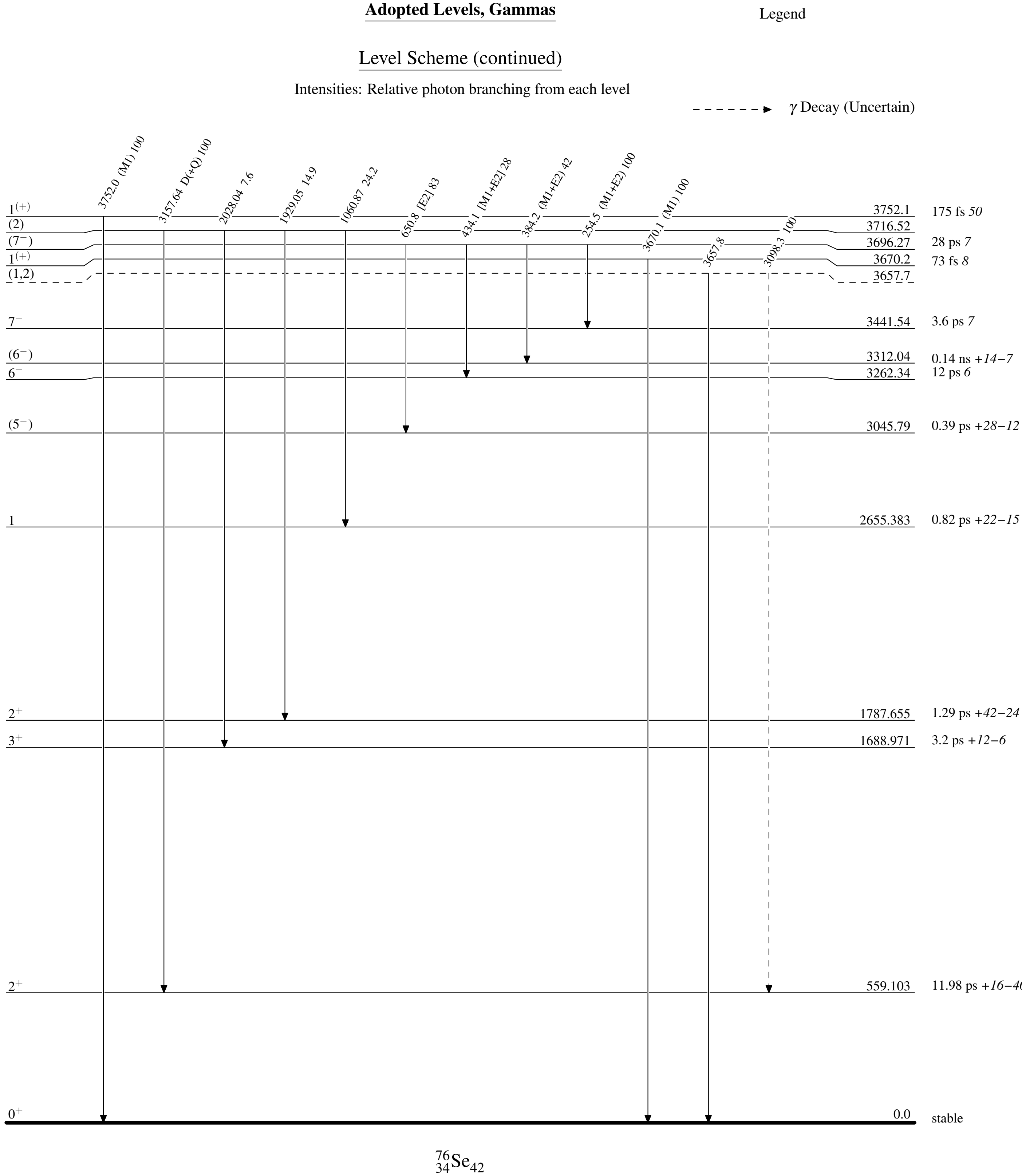


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

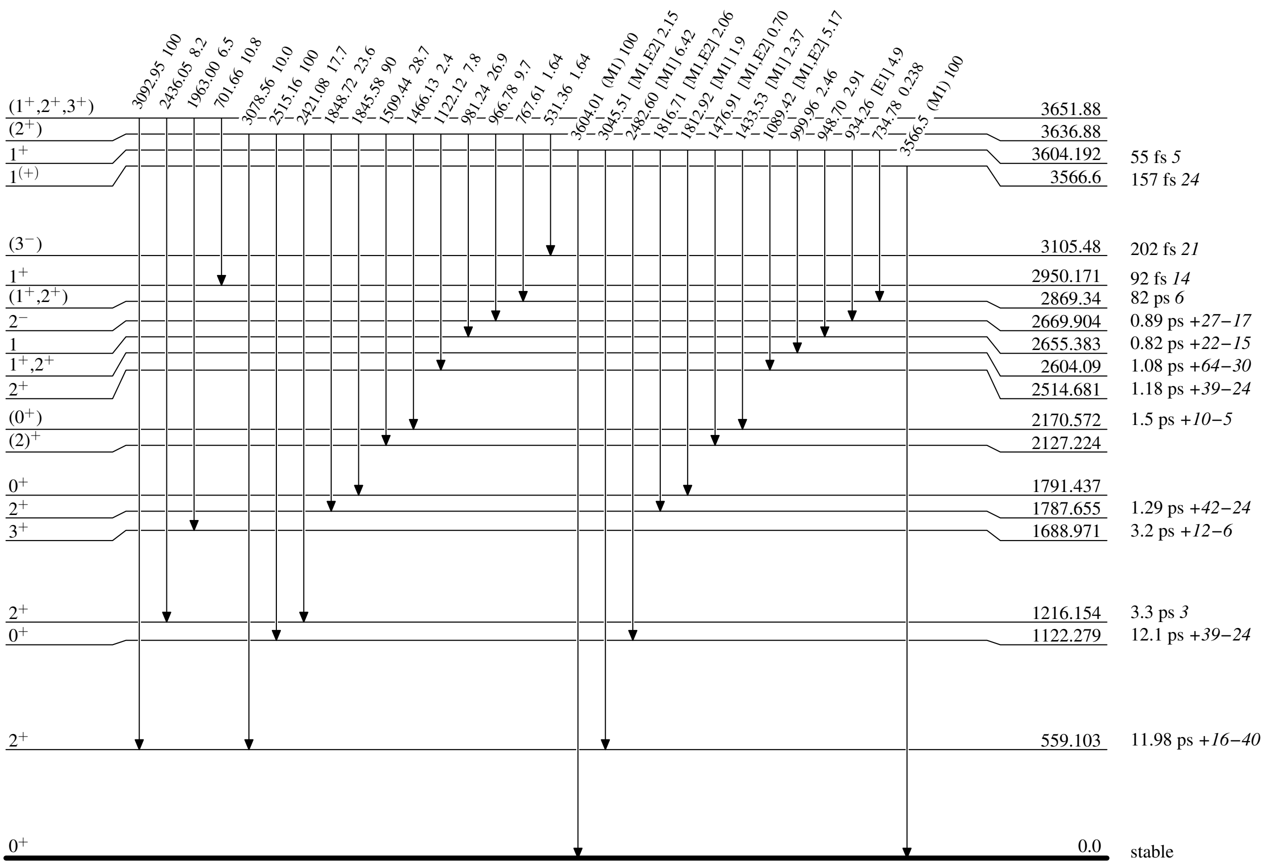
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

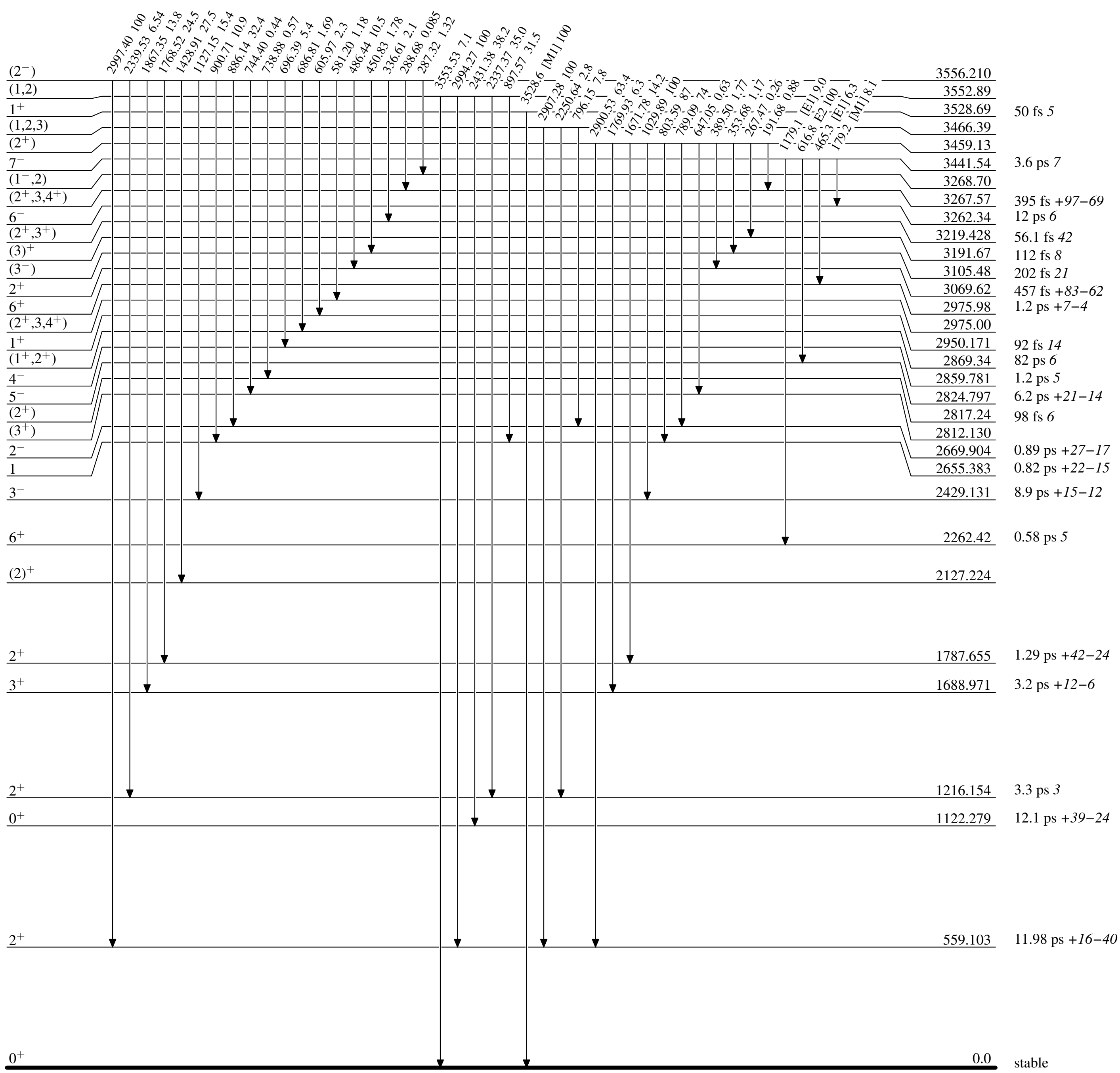


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

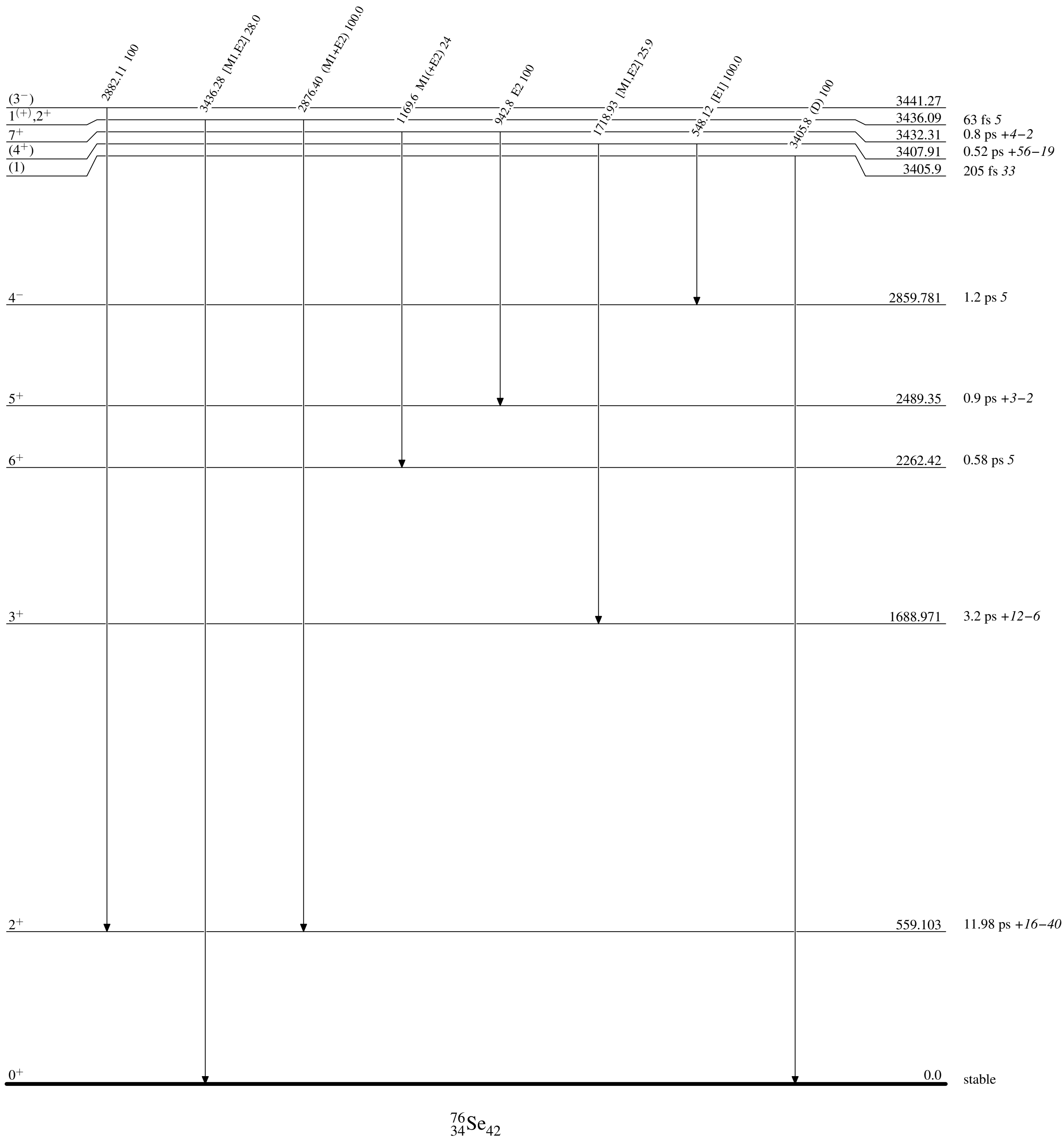


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

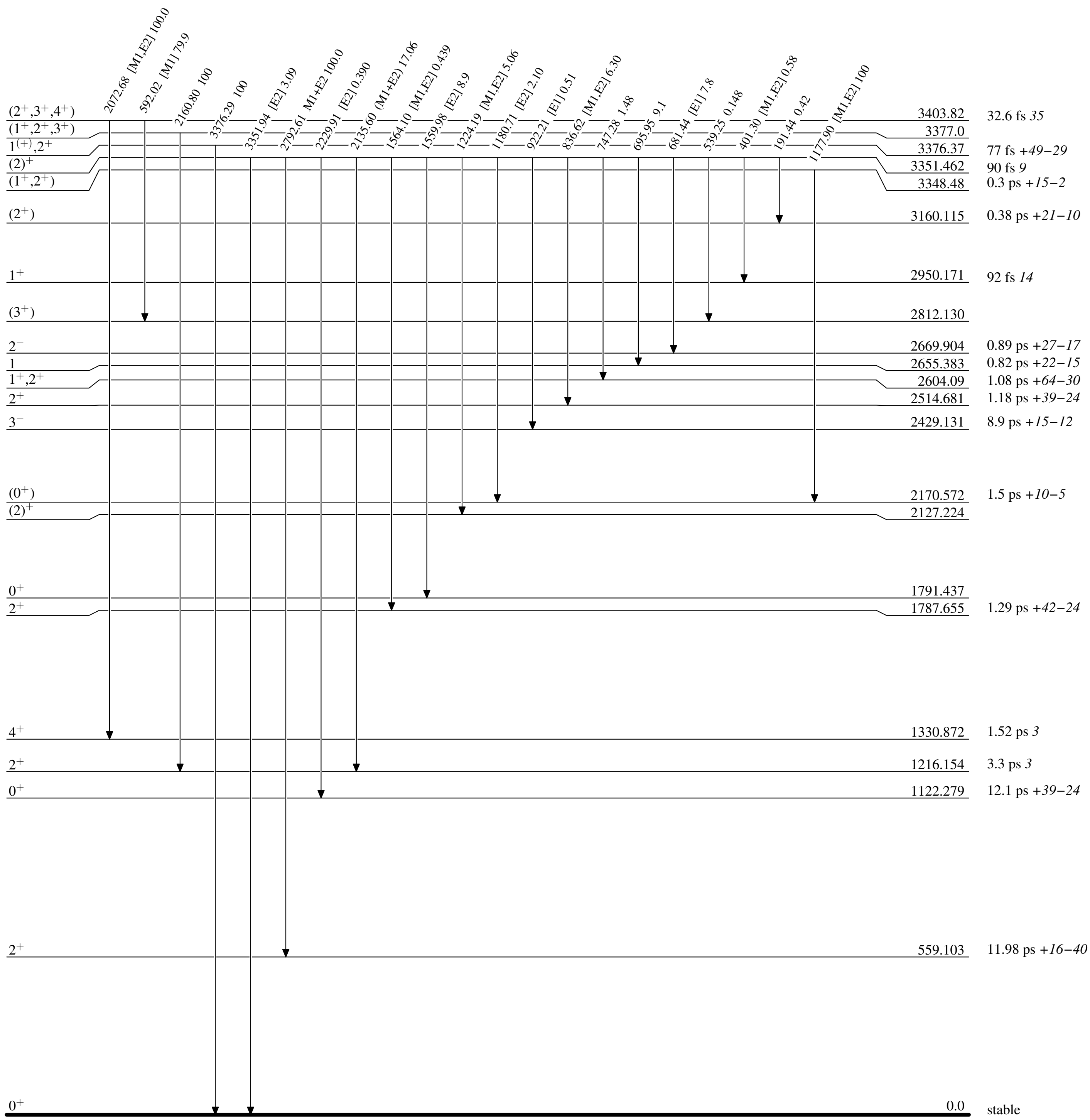
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

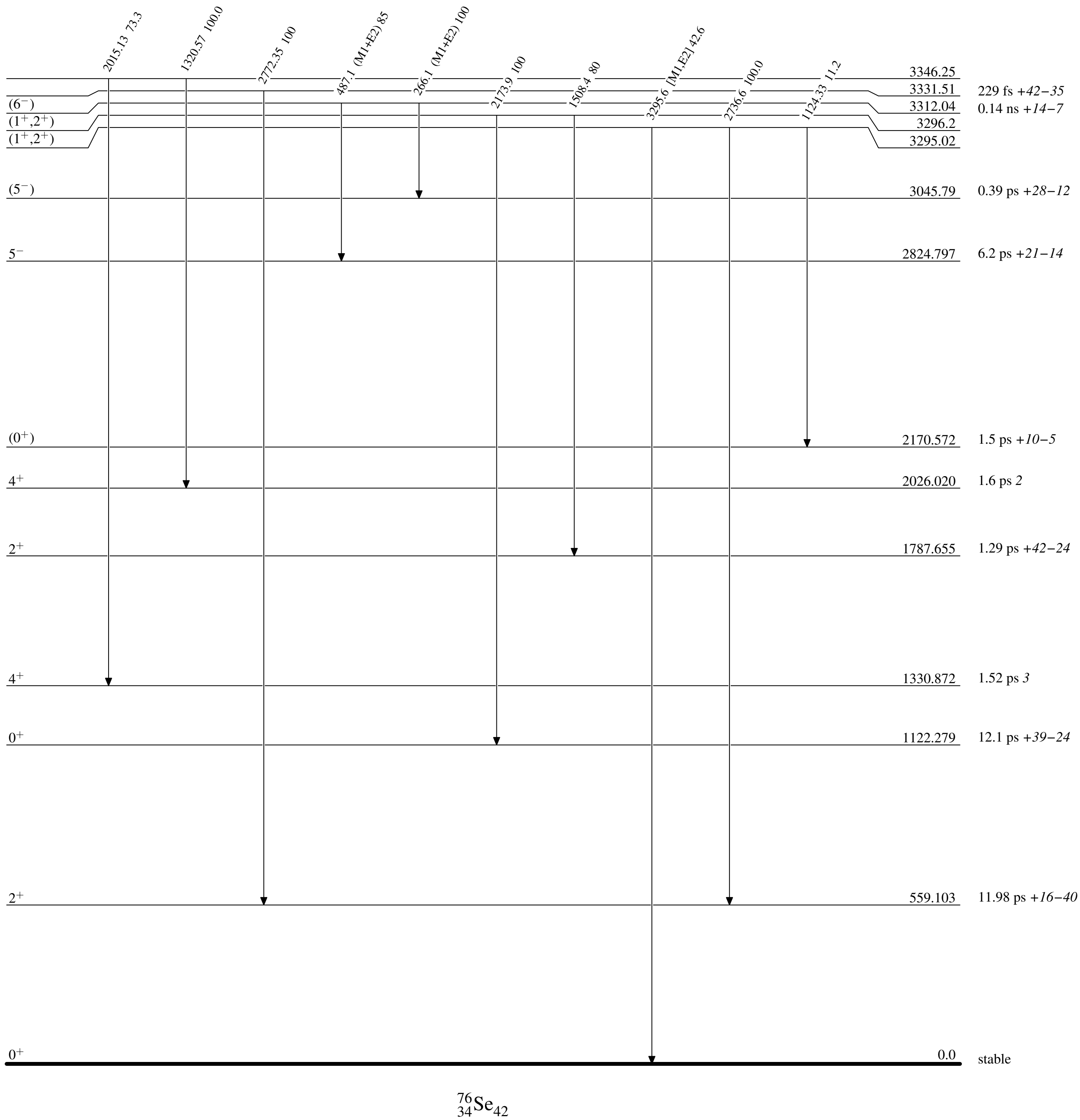


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

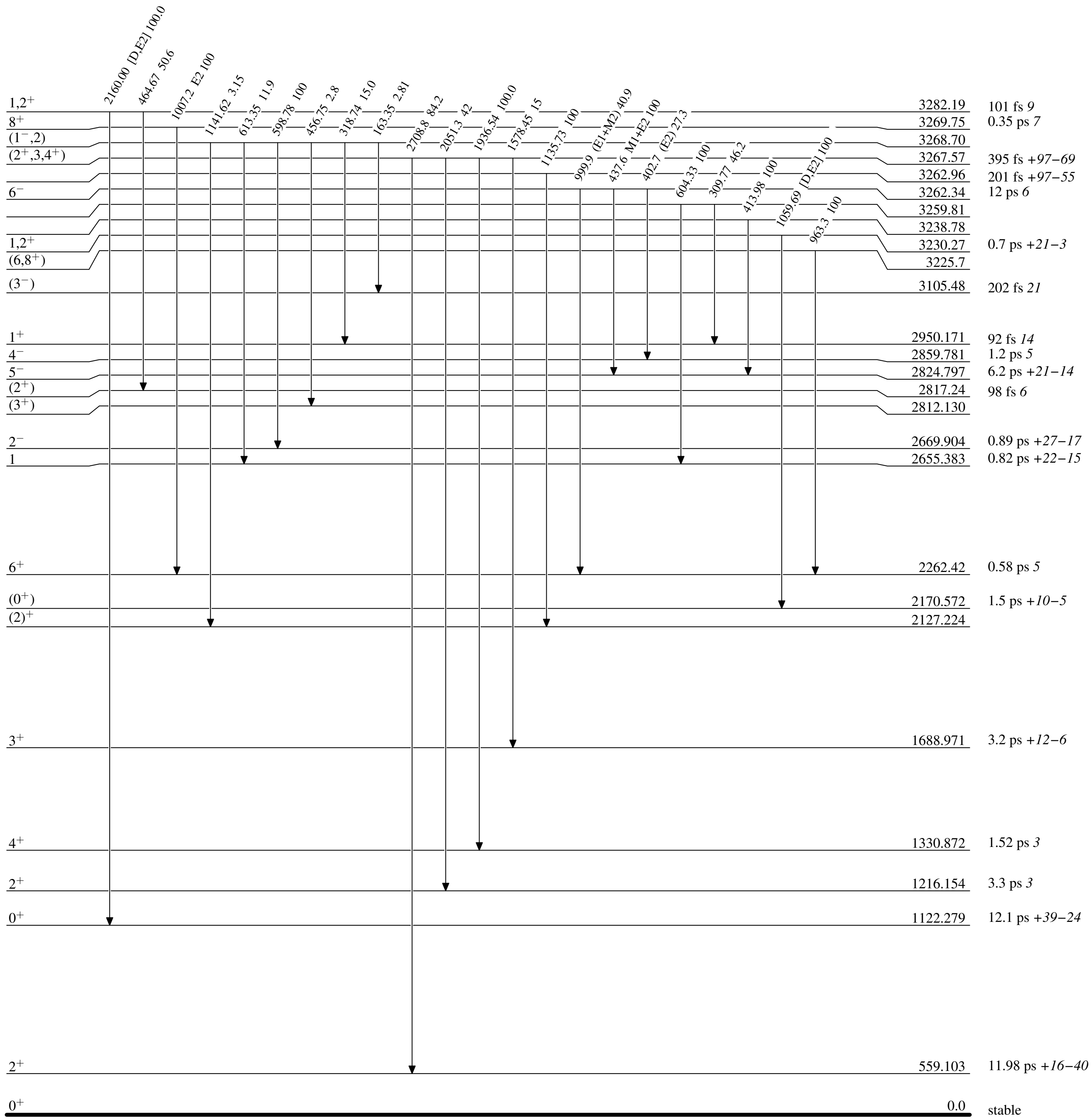
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

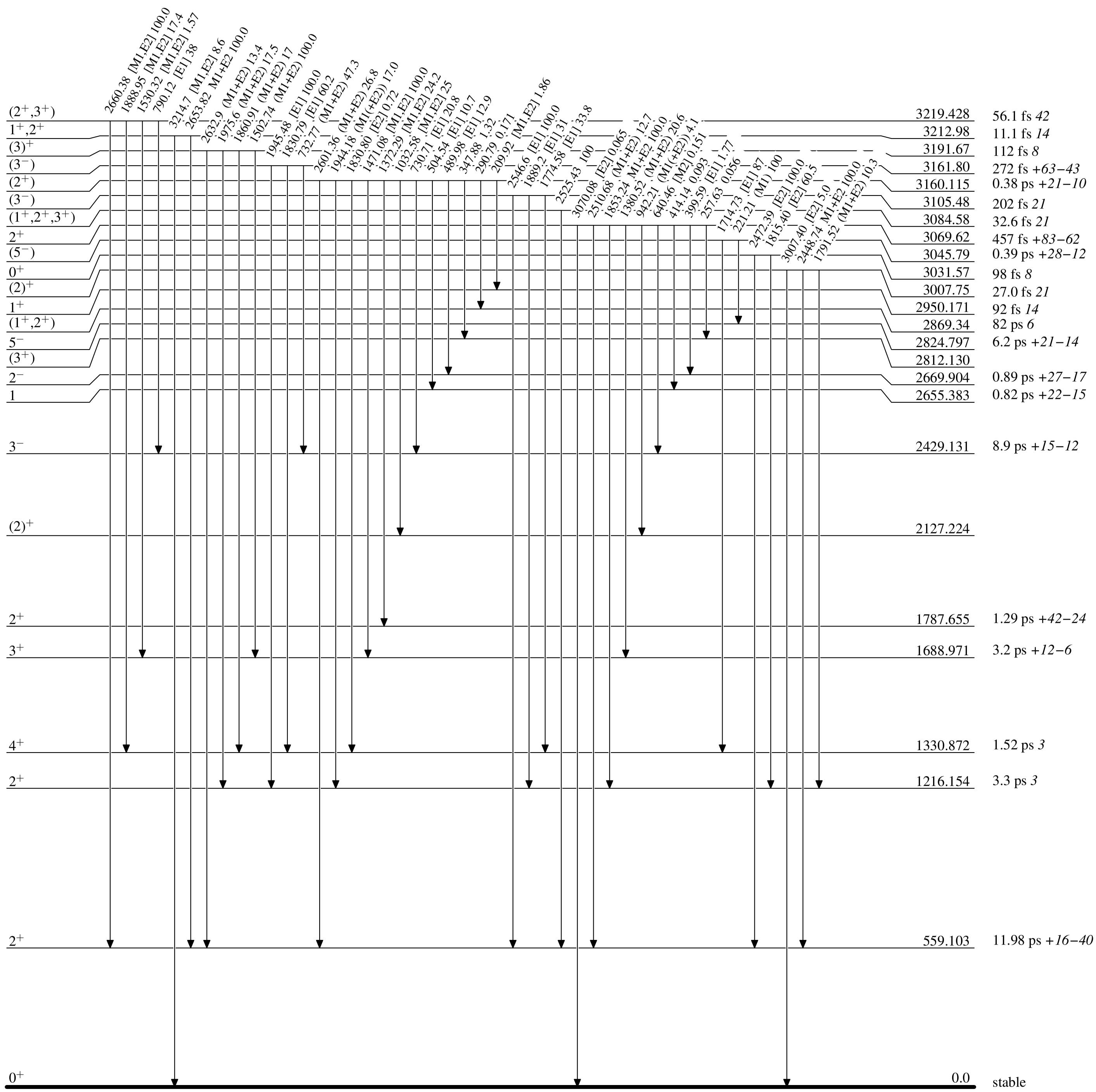


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

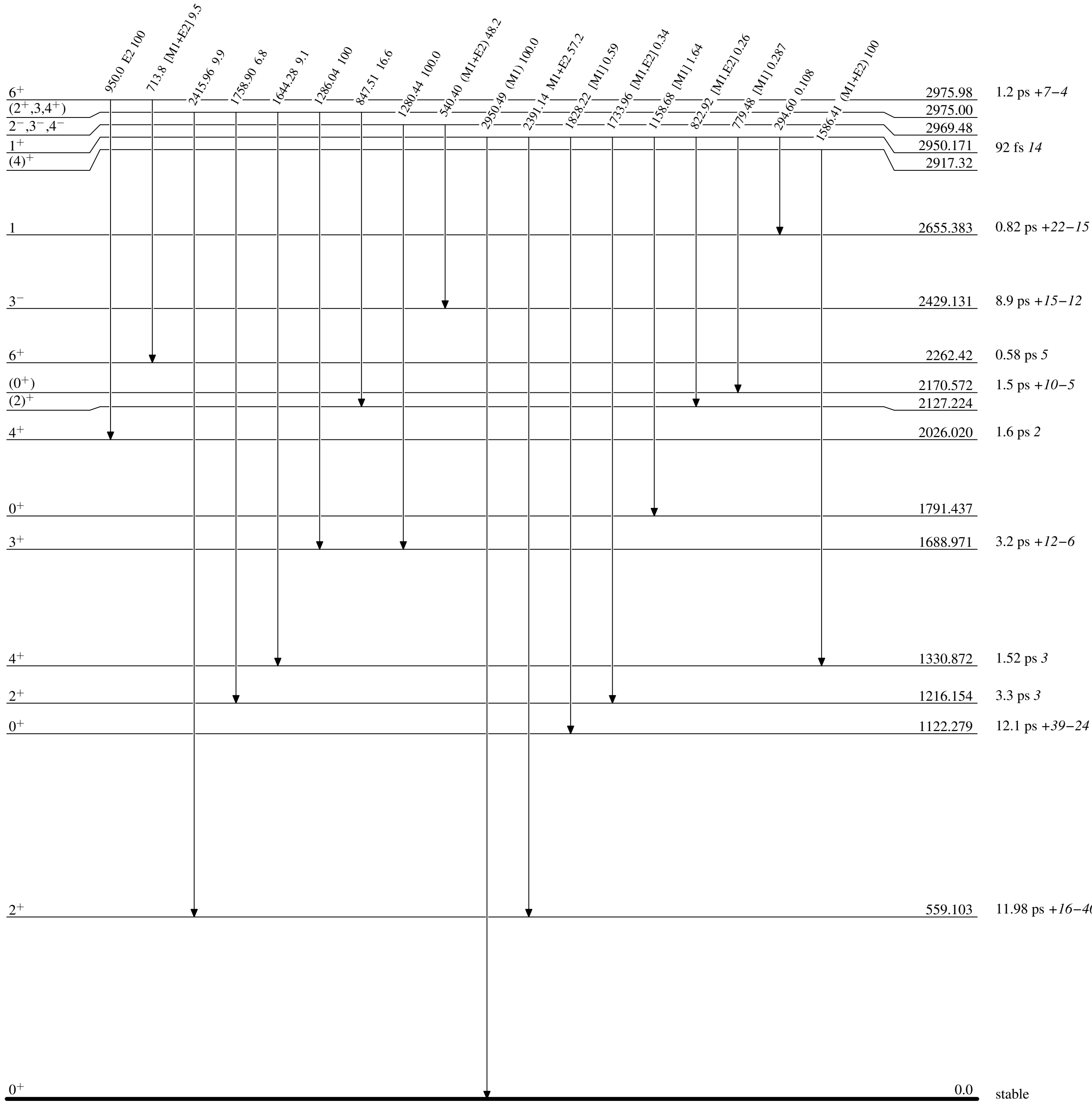


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

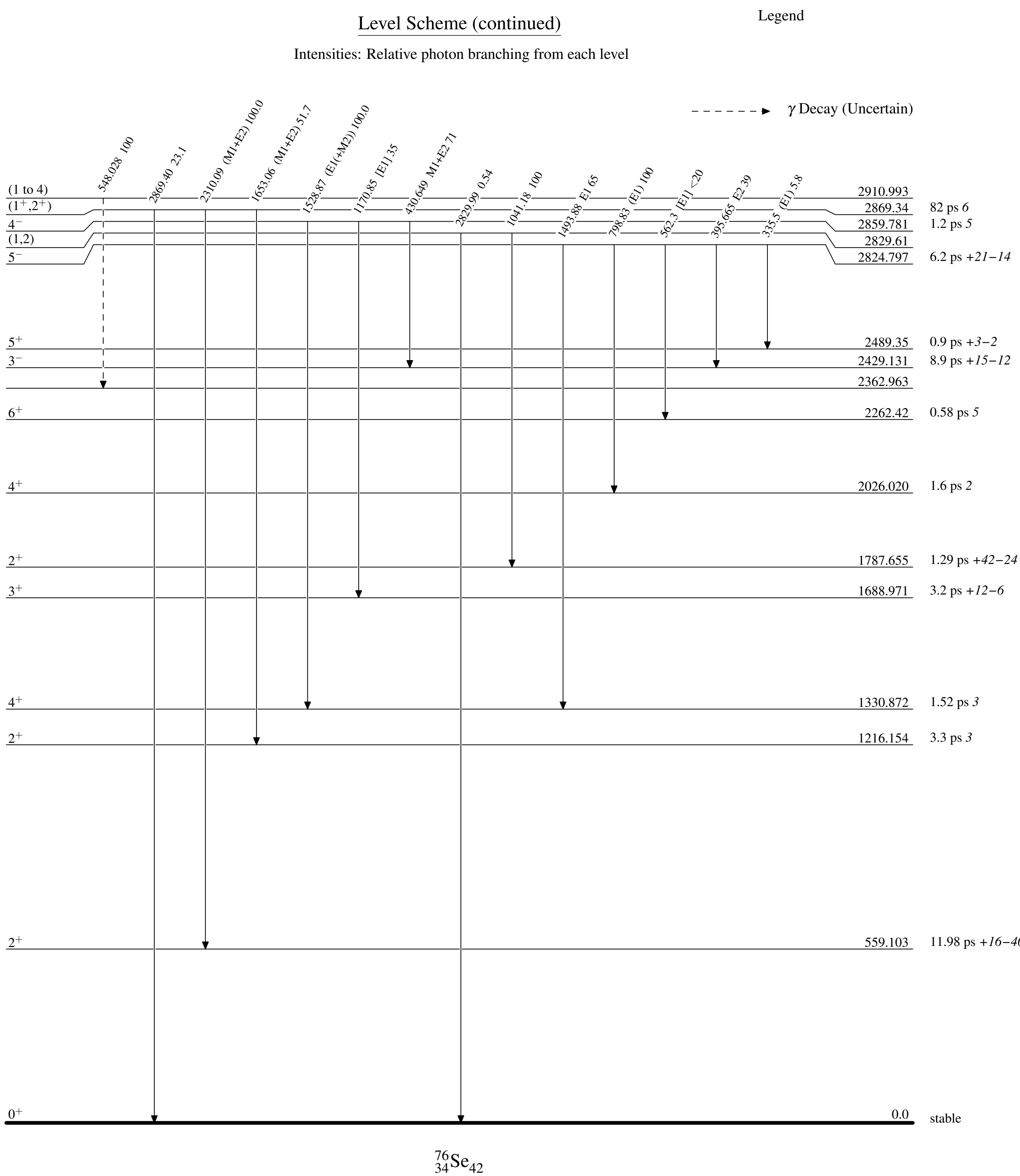


$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

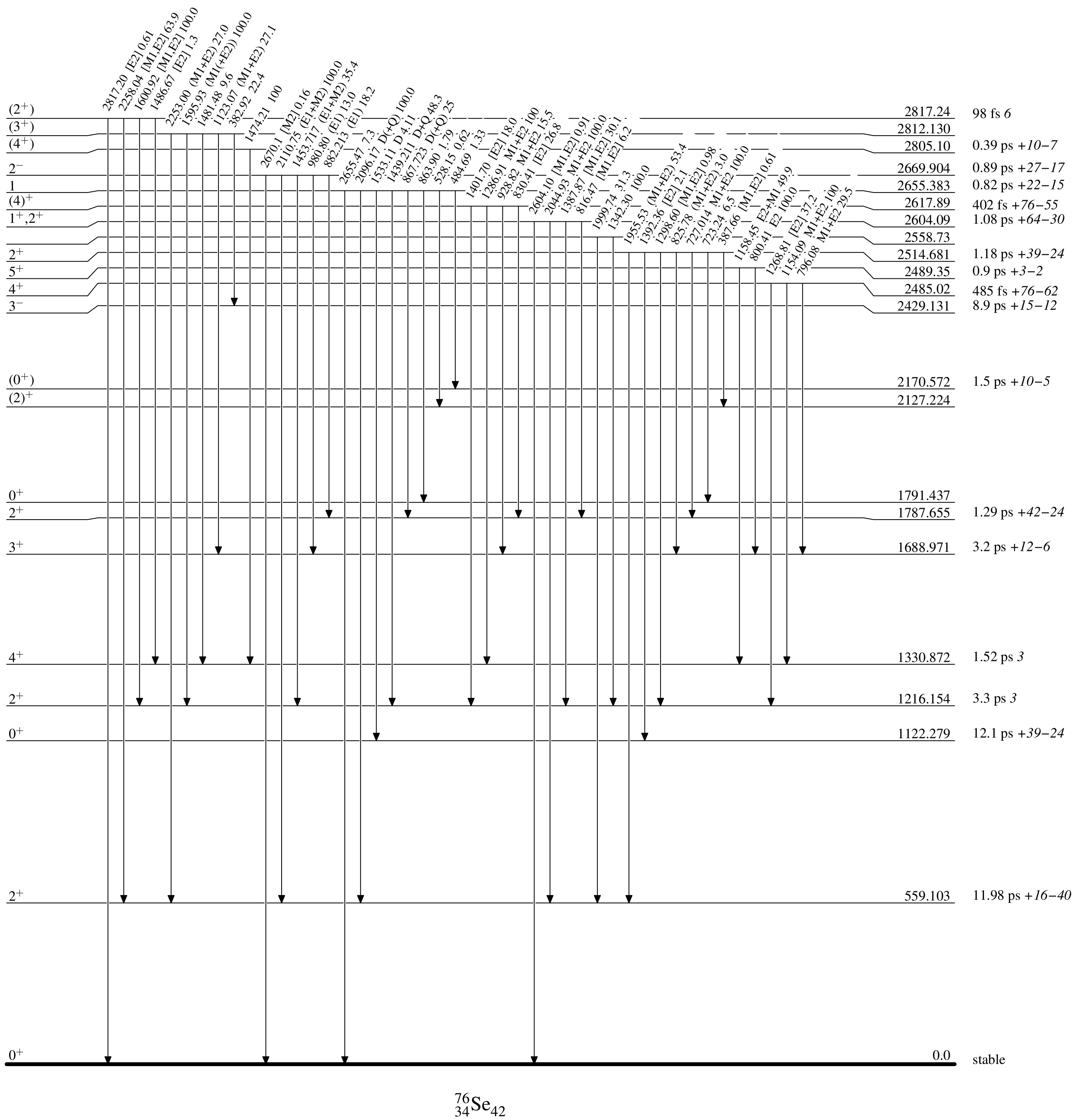
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



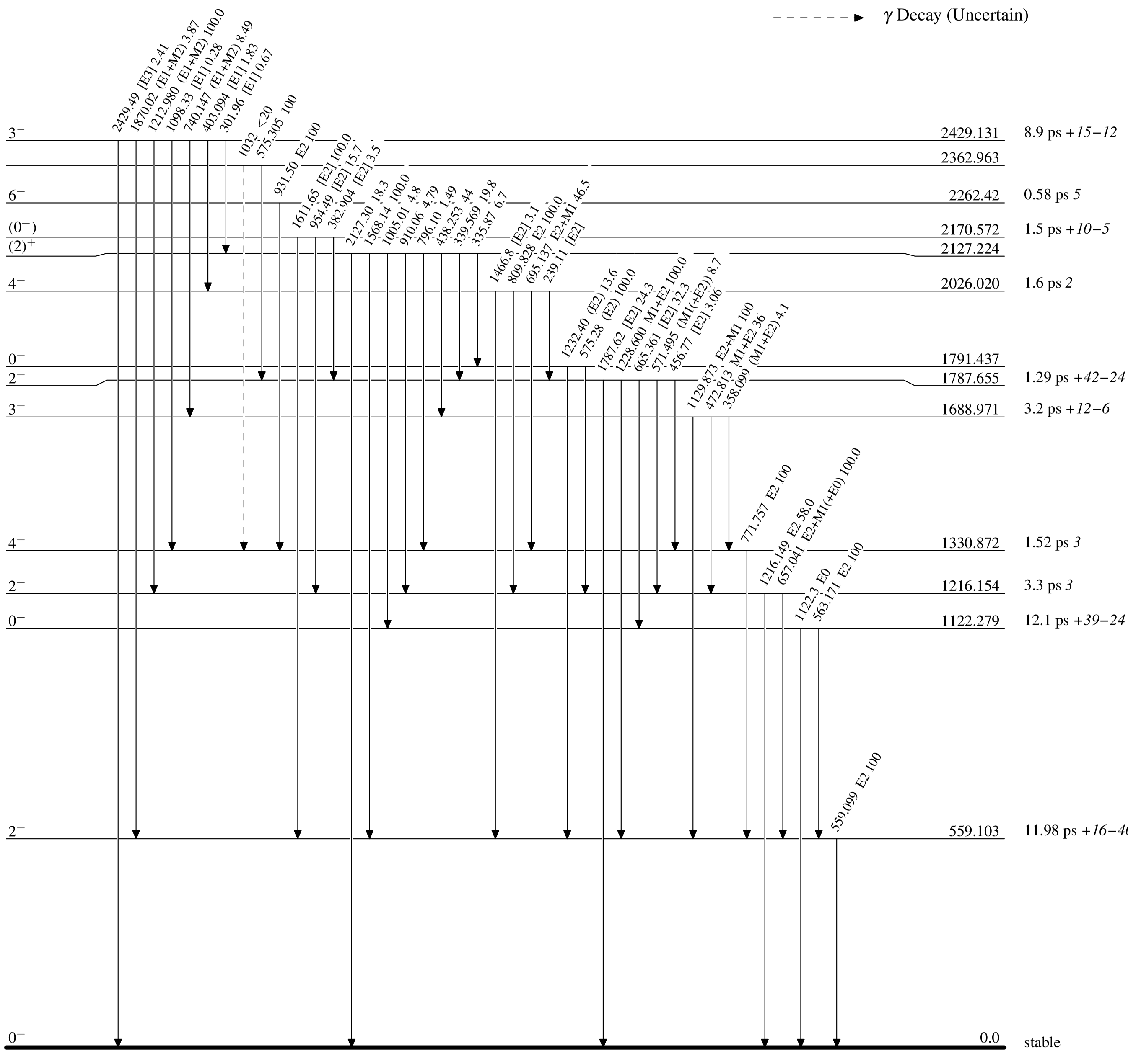
$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

Legend

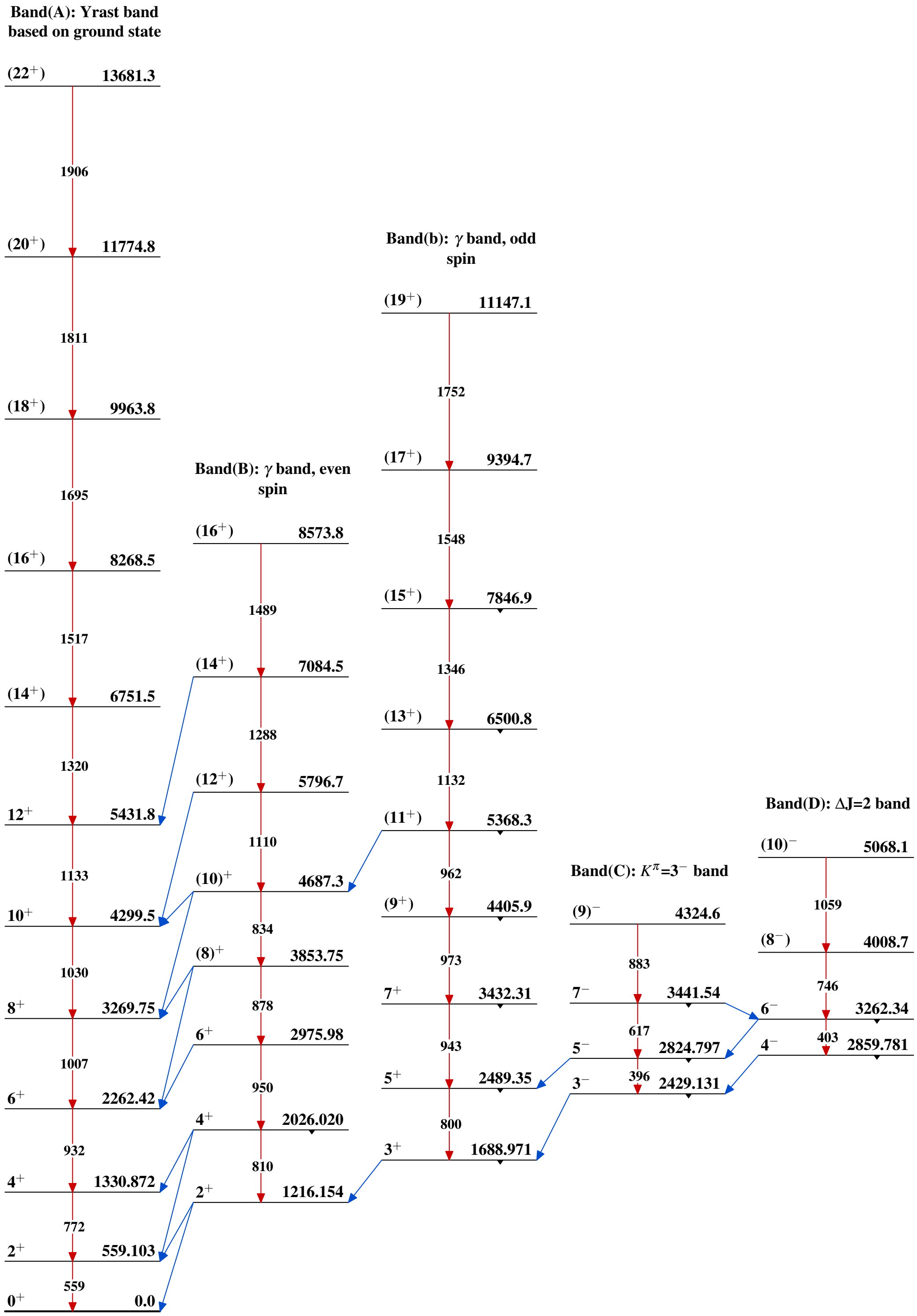
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{76}_{34}Se_{42}$

Adopted Levels, Gammas



$^{76}_{34}Se_{42}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110,1917 (2009)	30-Jun-2009

Q(β^-)=−3574 *4*; S(n)=10497.74 *17*; S(p)=10398.6 *18*; Q(α)=−6028.38 *18* 2012Wa38
Note: Current evaluation has used the following Q record −3574 4 *10497*.7317 *10398*.418-6028.4 *5* 2009AuZZ,2003Au03.
S(2n)=17916.59 *18*, s(2p)=18390.90 *19* (2009AuZZ,2003Au03). Values in 2003Au03 are within ≈0.1 keV of those in 2009AuZZ.
Additional information 1.
Mass measurements: 1985El01, 1982Zu04, 1977De20.
Nuclear structure calculations: 2008Yo07 (high-spin levels, B(E2), shell-model); 2008Ah03 (levels, B(E2), g factor, projected shell model).
^{78}Se(e,e): 1988Kh02, 1987Ku21, 1986Kh07.
See ^{77}Se(n,n),(n,γ):resonances dataset for 38 resonances between 41.2 eV to 3.91 keV.

^{78}Se Levels

Cross Reference (XREF) Flags

A	^{78}As β^- decay (90.7 min)	H	^{77}Se(n,γ) E=112.0 eV	O	^{78}Se(p,p′γ),(α,α′γ)
B	Muonic atom	I	^{77}Se(n,γ) E=211.6 eV	P	^{78}Se(α,α′)
C	^{78}Br ε decay (6.45 min)	J	^{77}Se(n,γ) E=340.8 eV	Q	^{78}Se(d,d′)
D	^{76}Ge(α,2nγ)	K	^{77}Se(n,γ) E=864.0 eV	R	Coulomb excitation
E	^{76}Ge(^{16}O,^{14}C)	L	^{77}Se(d,p)	S	^{80}Se(p,t)
F	^{76}Se(t,p)	M	^{78}Se(n,n′γ)		
G	^{77}Se(n,γ) E=thermal	N	^{78}Se(p,p′),(pol p,p′)		

E(level)[†]	J^π[‡]	$T_{1/2}$	XREF	Comments
0.0[#]	0^+	stable	ABCDEFG LMNOPQRS	
613.727[#] *3*	2^+	9.79 ps *21*	ABCDEFG J LMNOPQR	μ=+0.77 *5* (1998Sp03) Q=−0.20 *7* (2003Ha15) B(E2)↑=0.332 *7* <r^2>$^{1/2}$=4.1407 fm *18* (2004An14 evaluation). B(E2)↑: weighted average of 0.325 *45* (2003Ha15), 0.392 *66* (deduced from $T_{1/2}$=8.3 ps *14* (1987Sc07),RDM measurement in (α,2nγ)), 0.327 *7* (1977Le11), 0.385 *35* (1962St02), 0.35 *3* (1962Ga13), 0.36 *7* (1960Le07) and 0.36 *5* (1956Te26). All values, except for 1987Sc07, are from cross sections and yields in Coulomb excitation. Other: 0.335 *9* (2001Ra27 evaluation). $T_{1/2}$: from B(E2)=0.332 *7*. Other: 9.69 ps *26* (2001Ra27 evaluation). J^π: from L(t,p)=2. Also, L=2 and vector analyzing power in (p,p′). μ: from transient-field technique in Coul. ex. (1998Sp03), sign from 1969He11. Other: +0.78 *22* (1969He11,IMPAC technique). See also 1989Ra17 evaluation and 2005St24 compilation. Q: from Coulomb excitation (2003Ha15). Others:−0.26 *9* (1977Le11), −0.30 *11* (1976VoZY). See also 1989Ra17 evaluation and 2005St24 compilation.
1308.644[@] *5*	2^+	4.2 ps *3*	A CD FG KLMNOPQR	μ=0.66 *22* (1998Sp03) Q=+0.17 *9* (2003Ha15) μ: from transient-field technique in Coul. ex. (1998Sp03). See also 2005St24 compilation. Q: from Coulomb excitation (2003Ha15). $T_{1/2}$: from B(E2) in Coulomb excitation. Other: 3.8 ps *10* from recoil-distance method in (α,2nγ) (1987Sc07). Weighted

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Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				average of the two values is also 4.2 ps *3*. Jπ: from L(t,p)=2. Also, L=2 and vector analyzing power in (p,p′) and J=2 from circular polarization in (n,γ).
1498.599 *9*	0^+	45 ps *8*	A C FG LMNO qR	XREF: L(1510)q(1510). $T_{1/2}$: from B(E2)(↑) in Coul. ex. Jπ: 0 from γγ(θ) in (n,γ); L(d,p)=1.
1502.825# *13*	4^+	1.04 ps *5*	A D G MNOPqR	μ=1.6 *5* (1998Sp03) Q=−0.68 *15* (2003Ha15) XREF: q(1510). μ: from transient-field technique in Coul. ex. (1998Sp03). See also 2005St24 compilation. Jπ: γ(θ) and linear polarization in (α,2nγ). $T_{1/2}$: weighted average of 1.05 ps *5* from B(E2) in Coul. ex. and 0.9 ps *2* from DSA in (α,2nγ) (1987Sc07).
1758.689 *17*	0^+		A C G MNO Q	Jπ: J=0 from γγ(θ) in (n,γ); γ′s to 2^+.
1853.927@ *12*	3^+	1.2 ps *4*	A D G LMNO	XREF: L(1880). Jπ: γ(θ) and polarization measurements in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ) (1987Sc07).
1995.897 *8*	2^+	4.6 ps *+32−14*	A C FGH MNO QR	XREF: Q(2030). Jπ: L(t,p)=2; L(p,p′)=2; J=2 from circular polarization in (n,γ). $T_{1/2}$: from B(E2)(↑) in Coulomb excitation.
2190.65@ *18*	4^+	0.7 ps *3*	D MN Q	XREF: Q(2220). Jπ: γ(θ) and polarization measurements in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ) (1987Sc07).
2267.07 *12*			G	Jπ: γ to 2^+ suggests 0^+ to 4^+.
2299.8 *5*	$1,2^{(+)}$		M	Jπ: γ to 0^+.
2327.329 *19*	2^+	0.28 ps *+13−8*	A C G MNO	Jπ: M1+E2 γ to 2^+; J=2 from γγ(θ) in (n,γ). $T_{1/2}$: DSA in (n,n′γ).
2335.24 *5*	0^+		A C G M	Jπ: log *ft*=5.91 from 1^+; J=0 from γγ(θ) in (n,γ).
2361.85 *14*	(0^+)		FG L	Jπ: L(t,p)=0. But L(d,p)=1 for E=2360. It is possible that the (t,p) and (d,p) reactions correspond to the 2335 level.
2507.32& *5*	3^-	6.2 ps *14*	A DEFG MNOP R	B(E3)↑=0.027 *3* (2002Ki06,1974Ba80) B(E3)↑: from Coul. ex. Jπ: L(p,p′) and vector analyzing power in (p,p′). $T_{1/2}$: recoil-distance method in (α,2nγ) (1987Sc07).
2536.94 *4*	2^+	0.055 ps *7*	A C FG MNO	Jπ: L(t,p)=2. $T_{1/2}$: DSA in (n,n′γ).
2546.3 *3*			G	Jπ: γ to 4^+ suggests 2^+ to 6^+.
2546.51# *15*	6^+	0.49 ps *14*	D M	Jπ: γ(θ) and polarization in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
2560?	$(1^-,2^-,3^-)$		L	E(level): no uncertainty available. May correspond to adjacent level. Jπ: L(d,p)=(2).
2629.6 *5*			D	Jπ: γ to 4^+.
2647.472 *13*	$(1,2)^+$		A C G MNO	Jπ: log *ft*=6.24 from 1^+; γ′s to 2^+ and 3^+.
2682.110 *16*	4^+		A FG MNO	Jπ: L(t,p)=4, L(p,p′)=4. Jπ inconsistent with possible primary transition in (n,γ) and log $f^{1u}t$ from 2^- small, but decay mode of 2682 level is consistent in (n,γ), β^-, and (p,p′γ); so only one level appears to Be involved.

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Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)[†]	J^π[‡]	$T_{1/2}$	XREF	Comments
2719.3 *5*			M	
2735.0[@] *6*	(5$^+$)	0.62 ps *21*	D M	J^π: $\gamma(\theta)$ and band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ) (1987Sc07).
2742.52[&] *14*	4$^-$	0.42 ns *14*	D N	J^π: $\gamma(\theta)$ and polarization in (α,2nγ) (1987Sc07). E2 γ from 6$^-$ and E1 γ to 4$^+$. $T_{1/2}$: recoil-distance method in (α,2nγ) (1987Sc07).
2753.03 *18*	0$^+$		F	J^π: L(t,p)=0.
2754.46 *17*	2$^+$		G M O	J^π: γ(circ pol) in (n,γ); γ to 0$^+$. E(level): from primary transition in (n,γ). The 757 and 2140 γ's are not seen in (n,γ), and the 2156γ is not seen in (n,n$'\gamma$) or (p,p$'\gamma$). It is possible that the γ transitions define more than one level, in particular, the 2753 *10*+ level reported in (t,p) is perhaps being excited. Transitions from the 2754.46 level are both included in the least-squares fit for determining the energies of other levels.
2838.49 *7*	(2$^+$)		A G MN	J^π: γ's to 0$^+$ and 4$^+$.
2864.12 *7*			G N	J^π: γ to 3$^+$ suggests 1$^+$:5$^+$.
2889.90[&] *11*	5$^-$	18 ps *5*	D F M O	XREF: F(2893). $T_{1/2}$: recoil-distance method in (α,2nγ) (1987Sc07). J^π: L(t,p)=5; $\gamma(\theta)$ and polarization measurements in (α,2nγ).
2898.13 *6*	2		C G MN	J^π: $\gamma\gamma(\theta)$ in (n,γ).
2914.7 *5*	4$^+$	0.24 ns +*15*−*8*	F MNO	$T_{1/2}$: DSA in (n,n$'\gamma$) (1989Do14). J^π: L(t,p)=4.
2949.19 *16*	4$^-$	>1.4 ps	D LMNO	J^π: $\gamma(\theta)$ in (α,2nγ); L(d,p)=4. $T_{1/2}$: DSA in (α,2nγ).
3003 *9*	3$^-$		F	J^π: L(t,p)=3.
3005.70 *17*	1,2$^+$		C G J MNO	J^π: log *ft*=6.28 from 1$^+$; γ to 0$^+$.
3013.96[a] *13*	6$^-$	3.0 ns *5*	D F	J^π: $\gamma(\theta)$ and polarization data in (α,2nγ). $T_{1/2}$: $\gamma\gamma$(t) in (α,2nγ) (1987Sc07).
3039.81 *6*	(1$^+$ to 4$^+$)		G	J^π: γ's to 2$^+$ and 3$^+$.
3048.6 *10*	(3$^-$)		NO	J^π: L(p,p$'$)=(3); γ to 4$^+$.
3061 *12*	0$^+$&5$^-$		F	J^π: L(t,p)=0+5.
3088.7 *21*	(5$^-$)		f N	J^π: L(p,p$'$)=5. L(t,p)=0+4 for a doublet.
3089.73 *15*	(0$^+$)		C fG M	J^π: L(t,p)=0+4 for a doublet; γ to 2$^+$.
3130?	0$^+$,1$^+$,2$^+$		L	E(level): may Be same as 3090 level. J^π: L(d,p)=1.
3133.3 *5*	3$^-$		F M	J^π: L(t,p)=3.
3139.7 *15*	4$^+$		NO	J^π: L(p,p$'$)=4.
3140.2[@] *4*	(6$^+$)	0.28 ps +*14*−*7*	D	J^π: $\gamma(\theta)$ and band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ) (1987Sc07).
3144.46 *11*	3$^-$		A FG M	J^π: L(t,p)=3; γ's to 2$^+$ and 4$^+$.
3181.9 *5*	(2)$^+$		f MN	J^π: L(d,p)=1; γ to 0$^+$; L(t,p)=2.
3186.37 *14*	2$^+$		fG	J^π: L(t,p)=2; γ to 2$^+$.
3229.71 *13*	(1$^-$,2,3)		A M	J^π: γ's to 3$^-$ and 2$^+$; log *ft*=6.5 from 2$^-$.
3242.68 *7*	2$^+$		G MN	J^π: L(p,p$'$)=2. E(level): from primary transition in (n,γ). Deexciting transitions 3241.8 and 2627.87 (doubly placed) are placed by 1979BrZE, with additional transitions reported and placed by 1987Su05 (all from (n,γ)), and give excitation energies of 3242.8 *3*, 3242.8 *2*, 3241.5 *2*, 3243.3 *3* and 3243.4 *1*. The spread in

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Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
				excitation energies suggests that either one or more transitions are misplaced, or that there is more than one level at this energy. Transitions of energy 2629 and 3243 are reported also in (n,n′γ) and placed from a 3242 level. The 1484γ is not reported in (n,n′γ). Transitions from this level are not used in the least-squares fit for determining the energies of the other levels.
3254.83 *20*	$(0,1,2)^+$		C G M	J^{π}: γ to 2^+; log *ft*=5.93 from 1^+.
3288.27 *6*	1^-		FG M	J^{π}: L(t,p)=1.
3294.35 *23*	4^+		A F N	XREF: N(3288). J^{π}: L(t,p)=4; L(p,p′)=4.
3306.79[&] *16*	6^-	11 ps *4*	D	J^{π}: γ(θ) and polarization data in (α,2nγ). $T_{1/2}$: recoil-distance method in (α,2nγ) (1987Sc07).
3309.9 *20*			N	E(level): multiplet.
3329 *10*			F L	J^{π}: L(d,p)=1+4 suggests a doublet, with opposite parities.
3372.6 *3*	3^-		A N	J^{π}: L(p,p′)=3.
3383.69 *13*	0^+ to 4^+		C G	J^{π}: γ to 2^+.
3386.0 *5*	(2^+)		f M	J^{π}: γ′s to 2^+ and 0^+; L(t,p)=2+5 for doublet.
3391? *8*	(5^-)		f	J^{π}: L(t,p)=2+5 for a doublet.
3411.29 *18*	3^-		A F N	J^{π}: L(p,p′)=3. L(t,p)=(4) is inconsistent.
3439.6 *4*	(1)		G I M	J^{π}: γ to 0^+; γ from 0^- resonance.
3450.94 *14*	0^+		FG	J^{π}: L(t,p)=0; γ to 2^+.
3453 *4*	3^-		L N	J^{π}: L(p,p′)=3.
3488.2? *6*		0.12 ps *4*	D	J^{π}: γ to 6^+ and population in (α,2nγ) suggests $6,7,8^+$. $T_{1/2}$: DSA in (α,2nγ) (1987Sc07).
3494.40 *8*	$1,2^{(+)}$		G	J^{π}: γ to 0^+.
3496.26 *11*			A	J^{π}: γ′s to 2^+ and 3^-.
3522.91[&] *22*	7^-	1.4 ps *+7 −4*	D	J^{π}: γ(θ) in (α,2nγ); M1 γ to 6^-. $T_{1/2}$: from DSA in (α,2nγ).
3523.5 *5*	$1,2^{(+)}$		G	J^{π}: γ to 0^+.
3527 *14*	1^-		F	J^{π}: L(t,p)=1.
3546 *4*	$(2^-,3^-,4^-)$		F L N	J^{π}: L(d,p)=(3).
3550.15[a] *24*	(7^-)	3.5 ps *21*	D	J^{π}: band assignment in (α,2nγ). $T_{1/2}$: DSA and recoil-distance methods in (α,2nγ).
3585.0[#] *3*	8^+	0.42 ps *14*	D	J^{π}: γ(θ) and polarization data in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
3591.64 *15*	(1^-)		FG	J^{π}: L(t,p)=1, assuming 3598 *9* corresponds to 3591.6 level and not 3603.8; γ to 2^+.
3603.8 *10*	2^+		MN	J^{π}: L(p,p′)=2; γ to 2^+.
3624.2 *4*	$1,2^{(+)}$		fG	J^{π}: L(t,p)=2 for a possible doublet; γ to 0^+.
3628.1 *5*			fG	J^{π}: γ to 2^+.
3632.2 *4*	$(1^+,2^+)$		M	J^{π}: γ′s to 0^+ and 3^+.
3686.50 *16*	3^-		FG LMN	J^{π}: L(t,p)=3; L(d,p)=2.
3704.0[@] *8*	(7^+)	0.83 ps *21*	D	J^{π}: γ(θ) and band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
3711.3 *5*	(1,2,3)		A N	J^{π}: log *ft*=7.0 from 2^-; γ to 2^+.
3735.03 *17*	0^+ to 4^+		G	J^{π}: γ to 2^+.
3754 *15*			F	
3774 *4*	3^-		F N	E(level): from (p,p′). J^{π}: L(t,p)=3; L(p,p′)=3.
3830	$1^-,2^-,3^-$		L	J^{π}: L(d,p)=2.
3830.7[@] *3*	8^+	0.55 ps *14*	D	J^{π}: γ(θ) and polarization measurements in (α,2nγ). E(level): the 8^+ member of β band is either 3831 or 4121 level. $T_{1/2}$: DSA in (α,2nγ).

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Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
3881 *4*	3^-		N	J$^{\pi}$: L(p,p′)=3.
3894.55 *15*	2^+		FG	J$^{\pi}$: L(t,p)=2.
3933 *9*	2^+		F	J$^{\pi}$: L(t,p)=2.
3959.93 *24*	$1,2^{(+)}$		G	J$^{\pi}$: γ to 0^+.
3995 *4*	5^-		N	J$^{\pi}$: L(p,p′)=5.
3999.33 *15*	1^-		FG	J$^{\pi}$: L(t,p)=1.
4037.01 *21*	$(1^-,3^-)$		fG	J$^{\pi}$: L(t,p)=1+3 for a doublet; γ to 2^+.
4038 *10*	$(1^-,3^-)$		f	J$^{\pi}$: L(t,p)=1+3 for a doublet.
4048.0[&] *6*	8^-	0.9 ps *3*	D	J$^{\pi}$: $\gamma(\theta)$ and polarization data in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
4050 *4*	(5^-)		N	J$^{\pi}$: L(p,p′)=(5).
4079.7 *3*	$1,2^{(+)}$		G	J$^{\pi}$: γ to 0^+.
4106 *12*	1^-		F	J$^{\pi}$: L(t,p)=1.
4120?	$0^-,1^-$		L	J$^{\pi}$: L(d,p)=0.
4121.2 *3*	8^+	>0.7 ps	D	J$^{\pi}$: $\gamma(\theta)$ and polarization data in (α,2nγ). E(level): this level may Be the 8^+ member of β band, although, 3831 level is presently assigned as the 8^+ member. $T_{1/2}$: DSA in (α,2nγ). Upper limit is <0.35 ns from pulsed-beam γ-timing in (α,2nγ).
4122 *4*	4^+		F N	E(level): weighted average from (p,p′) and (t,p). J$^{\pi}$: L(t,p)=4; L(p,p′)=4.
4153.10 *16*	(1)		G I	J$^{\pi}$: γ from 0^- resonance.
4155 *4*	3^-		F N	J$^{\pi}$: L(p,p′)=3. E(level): weighted average from (p,p′) and (t,p).
4181.85 *14*	0^+		FG	J$^{\pi}$: L(t,p)=0.
4190?	$0^-,1^-$		L	J$^{\pi}$: L(d,p)=0.
4214.1[a] *4*	(8^-)	>1.4 ps	D	J$^{\pi}$: $\gamma(\theta)$ and band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
4224 *10*	3^-		F	E(level): an unplaced 6274.40 *16* transition in (n,γ), if a primary, would define a level at 4222.75 *17*, but the transition would Be 1^- to 3^-. J$^{\pi}$: L(t,p)=3.
4245.4 *5*	(1)		I	J$^{\pi}$: γ from 0^- resonance.
4253.11 *12*	(2^+)		fG	J$^{\pi}$: L(t,p)=5+2 for a doublet; γ′s to 2^+.
4253.64 *17*	(5^-)		f N	E(level): from (p,p′). J$^{\pi}$: L(t,p)=5+2 for a doublet; L(p,p′)=(4) seems inconsistent unless S=1 is involved.
4265 *10*	0^+		F	J$^{\pi}$: L(t,p)=0.
4297.38 *15*	2^+		FG	J$^{\pi}$: L(t,p)=2.
4341.61 *13*	$1,2^{(+)}$		G	J$^{\pi}$: γ to 0^+.
4345 *11*	3^-		F	J$^{\pi}$: L(t,p)=3.
4366.61 *15*	$(1)^-$		fG I L	J$^{\pi}$: L(t,p)=3+1 for a doublet; L(d,p)=2; γ′s to 0^+ and 2^+; γ from 0^- resonance.
4369 *11*	(3^-)		f	J$^{\pi}$: L(t,p)=3+1 for a doublet.
4386.68 *13*	$(1,2^+)$		G	J$^{\pi}$: γ to 0^+. Doubly-placed γ to 0^+.
4409 *11*	2^+		F	E(level): an unplaced 6091.81 *18* transition in (n,γ), if a primary, would define a level at 4405.65 *19*. J$^{\pi}$: L(t,p)=2.
4412.02[&] *24*	(9^-)		D	J$^{\pi}$: band assignment in (α,2nγ).
4424 *4*	(2^+)		N	E(level): an unplaced 6077.24 *18* transition in (n,γ), if a primary, would define a level at 4420.22 *19*. J$^{\pi}$: L(p,p′)=(2).
4448.24 *15*	$1,2^{(+)}$		G	J$^{\pi}$: γ′s to 0^+ and 2^+.
4451 *11*	$(0^+\&3^-)$		F	J$^{\pi}$: L(t,p)=0+3.
4468.6 *4*	$1,2^{(+)}$		G	J$^{\pi}$: γ to 0^+.

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Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
4483 *11*	4^+		F	J^{π}: L(t,p)=4.
4493 *4*	$(3)^-$		L N	J^{π}: L(d,p)=2. L(p,p′)=(3).
4509 *11*	2^+		F	J^{π}: L(t,p)=2.
4528.8 *4*			G	J^{π}: 0^+ to 4^+ from possible γ to 2^+.
4557 *4*			N	
4569 *11*	$(0^+\&4^+)$		F	E(level): an unplaced 5932.03 *21* transition in (n,γ), if a primary, would define a level at 4565.45 *22*. J^{π}: L(t,p)=0+4.
4591 *11*	$(3)^-$		F L	E(level): from (t,p). J^{π}: L(t,p)=(3); L(d,p)=2.
4616 *11*	4^+		F	J^{π}: L(t,p)=4.
4622 *4*	5^-		N	J^{π}: L(p,p′)=5.
4625.1[#] *5*	(10^+)		D	J^{π}: band assignment in (α,2nγ).
4639 *11*	3^-		F	J^{π}: L(t,p)=3.
4672.8 *3*			G	
4684.30 *17*			G	
4689.8 *3*	(2^+)		fG	J^{π}: γ to 0^+; L(t,p)=2.
4697.07 *13*	(2^+)		fG	J^{π}: γ to 0^+; L(t,p)=2.
4723.21 *18*	2^+		FG	J^{π}: L(t,p)=2.
4758 *11*	$4^+\&1^-$		F N	XREF: N(4741). E(level): doublet from mixed L-transfer. J^{π}: L(p,p′)=4; L(t,p)=4+1.
4786.9[@] *5*	(10^+)	>1.4 ps	D	J^{π}: $\gamma(\theta)$, pol in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
4787.93 *21*	$(1)^-$		G L	J^{π}: L(d,p)=0; γ to 2^+.
4791.5 *5*	0^+		FG	J^{π}: L(t,p)=0.
4811.5 *3*	2^+		FG	J^{π}: L(t,p)=2.
4819.2[a] *6*	(9^-)	0.9 ps *3*	D	J^{π}: band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
4857.0[@] *9*	(9^+)	1.1 ps *4*	D	J^{π}: $\gamma(\theta)$ and band assignment in (α,2nγ). $T_{1/2}$: DSA in (α,2nγ).
4857 *11*	1^-		F	J^{π}: L(t,p)=1.
4879 *11*	3^-		F	J^{π}: L(t,p)=3.
4902 *4*	3^-		L N	J^{π}: L(p,p′)=3; L(d,p)=2.
4904 *10*	2^+		F	J^{π}: L(t,p)=2.
4944 *11*	2^+		F	J^{π}: L(t,p)=2.
4957.3 *3*	$1,2^{(+)}$		G	J^{π}: γ to 0^+.
4972.3 *3*	1^-		FG L	XREF: F(4980)L(4970). J^{π}: L(t,p)=1; L(d,p)=2.
4998.3 *5*			G	
5004.65 *23*	$1,2^{(+)}$		G	J^{π}: γ′s to 0^+ and 2^+.
5022.14 *17*			G	
5029.63 *24*	2^+		FG	J^{π}: L(t,p)=2.
5055 *12*			F	
5090.8 *3*			FG	XREF: F(5081).
5094.8 *8*			D	
5101.9 *5*			FG	
5120?	$0^-,1^-$		L	J^{π}: L(d,p)=0.
5126.52 *16*	(2,3,4)		FG	J^{π}: γ′s to 2^+ and 3^+; multiply-placed γ to 4^+.
5136? *15*			F	E(level): may Be same as 5126 level.
5164.05 *16*			FG	XREF: F(5169). J^{π}: doubly-placed γ′s to 2^+.
5180.75 *22*	$1^{(+)},2^{(+)}$		FG	J^{π}: γ′s to 0^+ and 3^+.
5205 *15*	$1^-,2^-,3^-$		F L	XREF: L(5210). J^{π}: L(d,p)=2.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{78}Se Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
5235 *15*			F	
5247 *15*			F	
5290.22 *18*	$1,2^{(+)}$		G	Jπ: γ′s to 0^+ and 2^+.
5295.2 *3*	3^-		FG N	Jπ: L(p,p′)=3.
5339.7 *3*	$1,2^{(+)}$		G	Jπ: γ′s to 0^+ and 2^+.
5356.51 *17*	(2^+)		G L	Jπ: L(d,p)=(2); γ to 2^+.
5391.0 *3*			FG	
5422 *15*			F	
5440.3 *3*			G	
5451.2 *4*	$1,2^{(+)}$		G	Jπ: γ to 0^+.
5480?	$(1^+,2^+,3^+)$		L	Jπ: L(d,p)=(2).
5513.26 *19*	$1,2^{(+)}$		G	Jπ: γ to 0^+; multiply-placed γ to (4^+).
5580 *15*			F	
5610?	2^+		L	Jπ: L(d,p)=2.
5689.1 *8*			D	
5709 *15*			F	
5783.8# *7*	(12^+)	>0.6 ps	D	Jπ: band assignment. $T_{1/2}$: DSA in (α,2nγ).
5837 *15*			F	
6161 *15*			F	

† From (n,γ), (α,2nγ) or other γ-ray studies if populated in these sets. In addition to the states shown, broad peaks are reported at 1450, 1790, and 3560 in (^{16}O,^{14}C), and at 2360, 2550, 2730, 2830, 2990, 3170, 3270, 3370, 3500, and 3560 in (d,d′).
‡ Target $J^\pi=1/2^-$ for L(d,p) and 0^+ for L(t,p).
# Band(A): g.s. band.
@ Band(B): Probable β band.
& Band(C): Probable octupole band.
a Band(D): ΔJ=1 band based on 6^-.

Adopted Levels, Gammas (continued)

$\gamma(^{78}$Se)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	Comments
613.727	2^+	613.725 3	100	0.0	0^+	E2		B(E2)(W.u.)=33.5 8 Mult.: from $\gamma(\theta)$ and γ(pol) in (α,2nγ).
1308.644	2^+	694.916 4	100.0 20	613.727	2^+	E0+M1+E2	+3.5 5	B(M1)(W.u.)=0.00067 19; B(E2)(W.u.)=22.2 18 Mult.,δ: mult from $\gamma(\theta)$ in Coul. ex., δ from (n,γ). Others: +4.0 7 in (α,2nγ), +2.7 +9−6 in Coulomb excitation. X(E0/E2)=0.10 1 in (n,γ).
		1308.59 4	75.0 7	0.0	0^+	E2		B(E2)(W.u.)=0.76 6
1498.599	0^+	884.861 15	100	613.727	2^+	E2		B(E2)(W.u.)=1.17 21
		1498[b]		0.0	0^+	[E0]		X(E0/E2)≤0.07 in (n,γ).
1502.825	4^+	889.099 12	100	613.727	2^+	E2		B(E2)(W.u.)=49.5 24 Mult.: from $\gamma(\theta)$ in (α,2nγ) and Coul. ex.
1758.689	0^+	260.1[b]		1498.599	0^+	[E0]		X(E0/E2)≤1.36 in (n,γ).
		449.94 6	3.7 4	1308.644	2^+			
		1144.959 17	100 4	613.727	2^+	(E2)		Mult.: Q from $\gamma\gamma(\theta)$. $\Delta\pi$=no from level scheme.
		1758[b]		0.0	0^+	[E0]		X(E0/E2)≤0.27 in (n,γ).
1853.927	3^+	351.49 17	2.7 4	1502.825	4^+			
		545.300 13	51 7	1308.644	2^+	M1+E2	+0.42 4	B(M1)(W.u.)=0.032 12; B(E2)(W.u.)=25 10 δ: from $\gamma(\theta)$ in (n,n′γ). Others: +0.45 10 in (α,2nγ). Mult.: from angular distribution and polarization measurements in 1987Sc07 and 1982Ma45.
		1240.13 3	100 10	613.727	2^+	M1+E2	−0.41 +13−31	B(M1)(W.u.)=(0.0054 20); B(E2)(W.u.)=(0.8 5) Mult.,δ: M1+E2 from $\gamma(\theta$,pol) in (α,2nγ); δ from $\gamma\gamma(\theta)$ in (n,γ).
1995.897	2^+	497.294 7	11 2	1498.599	0^+	[E2]		B(E2)(W.u.)=10 +4−8
		687.254 7	57 5	1308.644	2^+	M1+E2(+E0)	−0.30 19	B(M1)(W.u.)=0.0034 +12−25; B(E2)(W.u.)=0.8 +10−8 Mult.,δ: from α(K)exp and $\gamma\gamma(\theta)$ (1987Su05) in (n,γ); δ=0.12 to 0.49; sign is negative. X(E0/E2)=0.26 to 9.5 in (n,γ).
		1382.16 3	58 5	613.727	2^+	E0+M1+E2	+0.44 10	B(M1)(W.u.)=0.00039 +13−28; B(E2)(W.u.)=0.05 +3−4 X(E0/E2)=11 4 in (n,γ). Mult.,δ: from α(K)exp and $\gamma\gamma(\theta)$ (1987Su05) in (n,γ).
		1995.87 8	100 4	0.0	0^+	[E2]		B(E2)(W.u.)=0.09 +3−6
2190.65	4^+	688.0 3	100 7	1502.825	4^+	(M1)		B(M1)(W.u.)=0.04 3
		881.7	<276	1308.644	2^+	[E2]		B(E2)(W.u.)=40 +50−40 E_γ: from (n,n′γ).
		1576 1	24 7	613.727	2^+			
2267.07		271.1 8	24 8	1995.897	2^+			
		958.37 19	40 6	1308.644	2^+			
		1653.28 15	100 9	613.727	2^+			
2299.8	$1,2^{(+)}$	2299.8 5	100	0.0	0^+			
2327.329	2^+	331.2 3	1.6 3	1995.897	2^+			

$^{78}_{34}$Se$_{44}$-8

γ(^{78}Se) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	Comments
2327.329	2^+	568.7 *4*	2.2 *3*	1758.689	0^+	[E2]		B(E2)(W.u.)=32 +*11*−*16*
		824.8[#] *4*	2.0 *5*	1502.825	4^+			
		1018.65 *5*	6.1 *3*	1308.644	2^+			
		1713.55 *3*	100 *6*	613.727	2^+	E0+M1+E2	−1.8 *5*	B(M1)(W.u.)=0.0031 +*17*−*20*; B(E2)(W.u.)=4.5 +*15*−*22* Mult.: from α(K)exp in (n,γ) (1987Su05). X(E0/E2)=1.21 *23* in (n,γ).
		2327.26 *6*	8 *4*	0.0	0^+	[E2]		B(E2)(W.u.)=0.10 +*6*−*7*
2335.24	0^+	575.0[#b] *10*	<41	1758.689	0^+			
		1026.59 *20*	10.8 *8*	1308.644	2^+			
		1721.50 *5*	100 *6*	613.727	2^+	E2		Mult.: from α(K)exp=0.00015 *5* in (n,γ) (1987Su05).
2361.85	(0^+)	1748.21 *15*	100	613.727	2^+			
2507.32	3^-	1004.73 *20*	20 *4*	1502.825	4^+	[E1]		B(E1)(W.u.)=9.E−6 *3*
		1198.6 *3*	100 *4*	1308.644	2^+	(E1(+M2))	+0.09 *5*	B(E1)(W.u.)=2.5×10^{-5} *6*; B(M2)(W.u.)=(0.6 +*8*−*6*) Mult.: from γ(θ) in (α,2nγ) (1987Sc07) and γ from 3^- to 2^+. δ: from γ(θ) in (n,n′γ).
		1893.46 *6*	18 *6*	613.727	2^+	(E1)		B(E1)(W.u.)=1.1×10^{-6} *5* Mult.: D+Q, −0.05<δ<−3.0 from γγ(θ) in (n,γ). Δπ=yes from level scheme.
2536.94	2^+	203.3[#] *5*	4.1 *10*	2335.24	0^+			
		1039.3 *3*	3 *1*	1498.599	0^+	[E2]		B(E2)(W.u.)=10 *4*
		1228.25 *17*	28 *2*	1308.644	2^+			
		1923.15 *4*	100 *6*	613.727	2^+	(M1+E2)	−1.1 *11*	Mult.: D+Q, δ<2.2, sign=− from γγ(θ) in (n,γ). Δπ=no from level scheme.
2546.3		279.0 *8*	100 *17*	2267.07				
		1043.6[&] *4*	10[&] *4*	1502.825	4^+			
2546.51	6^+	1043.9 *3*	100	1502.825	4^+	E2		B(E2)(W.u.)=47 *14* Mult.: from ce measurements in (α,2nγ).
2629.6		1126.8 *5*	100	1502.825	4^+			
2647.472	$(1,2)^+$	286.4 *4*	15 *5*	2361.85	(0^+)			
		320.3 *3*	11 *4*	2327.329	2^+			
		651.573 *11*	43 *3*	1995.897	2^+			
		793.5 *3*	14.2 *20*	1853.927	3^+			
		1338.78 *5*	100 *7*	1308.644	2^+			
2682.110	4^+	174.2 *3*	2.2 *5*	2507.32	3^-			E_γ: from β^- decay.
		354.735 *25*	21 *4*	2327.329	2^+			
		686.3 *2*	12 *2*	1995.897	2^+			E_γ: from β^- decay.
		828.189 *13*	100 *8*	1853.927	3^+	(M1+E2)	+1.0 *7*	Mult.: D+Q, δ=+0.32 to +1.63 from γγ(θ) in (n,γ). Δπ=no from level scheme.
		1373.48 *6*	54 *4*	1308.644	2^+			
		2068.4 *4*	6.5 *14*	613.727	2^+			
2719.3		1410.6 *5*	100	1308.644	2^+			

$^{78}_{34}Se_{44}$-9

γ(^{78}Se) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	Comments
2735.0	(5$^+$)	1232.2 *6*	100 *14*	1502.825	4$^+$				
2742.52	4$^-$	551.9 *2*	100 *6*	2190.65	4$^+$	E1			B(E1)(W.u.)=3.1×10^{-6} *11*
		889[b] *1*	10	1853.927	3$^+$	[E1]			B(E1)(W.u.)=7.4×10^{-8} *25* I_γ: from coin. No uncertainty given.
		1239.4 *3*	59	1502.825	4$^+$	[E1]			B(E1)(W.u.)=1.6×10^{-7} *6* I_γ: from coin. No uncertainty given.
2754.46	2$^+$	757.2 *5*	35 *8*	1995.897	2$^+$				E_γ: from (n,n′γ). Observed only in (n,n′γ) and (p,p′γ).
		1256.7 *4*	38 *8*	1498.599	0$^+$				E_γ: reported only in (n,γ).
		1445.8 *2*	100 *15*	1308.644	2$^+$				
		2140.8 *9*	35 *11*	613.727	2$^+$				E_γ: from (n,n′γ). Observed only in (n,n′γ) and (p,p′γ).
2838.49	(2$^+$)	156.6 *3*	3.7 *9*	2682.110	4$^+$				E_γ: from ^{78}As β^- decay only.
		503.7 *2*	16.7 *16*	2335.24	0$^+$				E_γ: from ^{78}As β^- decay only.
		842.36 *19*	32 *4*	1995.897	2$^+$				
		1079.67 *22*	46 *4*	1758.689	0$^+$				I_γ: Iγ(842γ):Iγ(1080γ):Iγ(1530γ) from (n,γ). Values from (n,n′γ) are 233 *67*:100 *33*:100 *33* and from β^- decay are 43 *5*:65 *5*: 100 *7*.
		1529.60 *17*	100 *6*	1308.644	2$^+$				
		2224.7 *3*	37 *5*	613.727	2$^+$				E_γ: from ^{78}As β^- decay only.
		2839.0 *3*	2.2 *11*	0.0	0$^+$				E_γ: from ^{78}As β^- decay only.
2864.12		504.4[b] *2*	43 *10*	2361.85	(0$^+$)				E_γ: very poor fit in level scheme. Level-energy difference=502.3. Placement is suspect.
		1010.19 *6*	100 *10*	1853.927	3$^+$				
2889.90	5$^-$	343.5 *2*	15.9 *8*	2546.51	6$^+$	E1			B(E1)(W.u.)=5.4×10^{-5} *16* Mult.: from γ(θ) and polarization data in (α,2nγ).
		382.42 *17*	33.3 *15*	2507.32	3$^-$	E2		0.00650	B(E2)(W.u.)=43 *13*
		1387.4 *2*	100 *5*	1502.825	4$^+$	E1			B(E1)(W.u.)=5.2×10^{-6} *15* Mult.: from γ(θ) and polarization data in (α,2nγ).
2898.13	2	391.3[#] *5*	5 *2*	2507.32	3$^-$				
		902.3[#] *3*	11 *3*	1995.897	2$^+$				
		2284.37 *6*	100 *12*	613.727	2$^+$	D+Q	−0.9 *8*		Mult.: from γγ(θ) in (n,γ), δ=0.11 to 1.69; sign=negative.
2914.7	4$^+$	1411.9 *5*	100	1502.825	4$^+$				
2949.19	4$^-$	441.7 *2*	100 *11*	2507.32	3$^-$	M1+E2	−0.6 *3*		B(M1)(W.u.)<0.076; B(E2)(W.u.)<250 Mult.,δ: from (α,2nγ).
		1095.2 *5*	56	1853.927	3$^+$	[E1]			B(E1)(W.u.)<5.1×10^{-5}
		1446.7 *5*	67	1502.825	4$^+$	[E1]			B(E1)(W.u.)<2.6×10^{-5}
3005.70	1,2$^+$	2391.93[&] *17*	100[&] *11*	613.727	2$^+$				
		3005.9 *10*	13 *2*	0.0	0$^+$				E_γ: observed only in ^{78}Br ε decay.
3013.96	6$^-$	124.1 *1*	32.3 *16*	2889.90	5$^-$	M1		0.0566	B(M1)(W.u.)=0.00077 *14* Mult.: from (α,2nγ).
		271.4 *1*	100 *3*	2742.52	4$^-$	(E2)		0.0211	B(E2)(W.u.)=4.0 *7* Mult.: from (α,2nγ).

$^{78}_{34}$Se$_{44}$-10

Adopted Levels, Gammas (continued)

$\gamma(^{78}\mathrm{Se})$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	Comments
3013.96	6^-	467.4 2	24.2 16	2546.51	6^+	E1		B(E1)(W.u.)=1.8×10^{-7} 4 Mult.: from (α,2nγ).
3039.81	(1^+ to 4^+)	1043.6[&] 4	14[&] 5	1995.897	2^+			
		1186.02 12	52 7	1853.927	3^+			
		1731.11 7	100 7	1308.644	2^+			
3048.6	(3^-)	1545.8 10	100	1502.825	4^+			
3089.73	(0^+)	2475.96 15	100	613.727	2^+			
3133.3	3^-	2519.5 5	100	613.727	2^+			
3139.7	4^+	1831.0 15	100	1308.644	2^+			
3140.2	(6^+)	593.7 5	61 6	2546.51	6^+	M1(+E2)	−0.2 2	B(M1)(W.u.)=0.14 +4−8; B(E2)(W.u.)=(20 +40−20)
		949.6 4	100 12	2190.65	4^+	[E2]		B(E2)(W.u.)=82 +24−43
3144.46	3^-	462.2 2	41 4	2682.110	4^+			
		637.1 2	14 2	2507.32	3^-			
		1290.6 6	7 2	1853.927	3^+			
		1642.0 3	11 3	1502.825	4^+			
		1835.8 2	100 7	1308.644	2^+			E_γ: weighted average from β^- decay and (n,n′γ). E=1834.58 23 is reported in (n,γ) but is probably not the same transition.
3181.9	$(2)^+$	3181.8 5	100 17	0.0	0^+			
3186.37	2^+	2572.60 14	100	613.727	2^+			
3229.71	(1^-,2,3)	722.4 2	11 1	2507.32	3^-			
		1732[b] 1		1498.599	0^+			E_γ: from (n,n′γ).
		1921.3 3	100 24	1308.644	2^+			
		2615.8 2	52 8	613.727	2^+			
3242.68	2^+	595.89 10	28 3	2647.472	$(1,2)^+$			
		976.31 23	15 3	2267.07				
		1387.56 20	36 4	1853.927	3^+			
		1484.12 17	94 6	1758.689	0^+			
		1744.24 23	28 4	1498.599	0^+			
		2627.87[&] 14	82[&] 10	613.727	2^+			
		3241.8 4	100 14	0.0	0^+			
3254.83	$(0,1,2)^+$	2641.05 20	100	613.727	2^+			
3288.27	1^-	1292.49 10	22 3	1995.897	2^+			
		1979.57 8	6.9 23	1308.644	2^+			
		2674.36 13	100 15	613.727	2^+			
3294.35	4^+	756.9 3	5 1	2536.94	2^+			
		968.2 7	9 3	2327.329	2^+			
		1440.9 7	19 6	1853.927	3^+			
		1791.9 7	56 6	1502.825	4^+			
		2681.3 7	100 6	613.727	2^+			

$^{78}_{34}\mathrm{Se}_{44}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{78}Se)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
3306.79	6^-	357.3 3	21.4 18	2949.19	4^-	E2		0.00816	B(E2)(W.u.)=50 19 Mult.: from (α,2nγ).
		416.9 2	100 6	2889.90	5^-	M1+E2	−0.4 1		B(M1)(W.u.)=0.012 5; B(E2)(W.u.)=15 9
		564.4 4	27 4	2742.52	4^-	E2			B(E2)(W.u.)=6 3 Mult.: Q from $\gamma(\theta)$ in (n,γ) and RUL.
		760.4 3	42.9 18	2546.51	6^+	(E1)			B(E1)(W.u.)=1.7×10^{-5} 7 Mult.: from (α,2nγ).
3372.6	3^-	2064.1 5	100 33	1308.644	2^+				
		2758.8 3	100 19	613.727	2^+				
3383.69	0^+ to 4^+	2769.91 13	100	613.727	2^+				
3386.0	(2^+)	2772.0 5	100 25	613.727	2^+				
		3387 1	50 13	0.0	0^+				
3411.29	3^-	903.6 4	39 13	2507.32	3^-				
		2797.6 2	100 13	613.727	2^+				
3439.6	(1)	3439.5 4	100	0.0	0^+				
3450.94	0^+	2837.16 14	100	613.727	2^+				
3488.2?		941.7 5	100	2546.51	6^+				
3494.40	$1,2^{(+)}$	655.90 7	100 8	2838.49	(2^+)				
		1159.09 10	82 22	2335.24	0^+				
		1499.1 3	65 16	1995.897	2^+				
3496.26		657.9 2	58 6	2838.49	(2^+)				
		959.0 2	100 10	2536.94	2^+				
		988.2 4	20 5	2507.32	3^-				
		1169.5 4	26 7	2327.329	2^+				
		2187.8 2	78 8	1308.644	2^+				
3522.91	7^-	216.1 2	12.9 16	3306.79	6^-	M1		0.01327	
		509 1	64	3013.96	6^-				
		633.0 5	100	2889.90	5^-	E2			
		976.7 4	53 5	2546.51	6^+	(E1)			
3523.5	$1,2^{(+)}$	3523.4 5	100	0.0	0^+				
3550.15	(7^-)	536.2 2	100	3013.96	6^-				
3585.0	8^+	1038.6 3	100	2546.51	6^+	E2			B(E2)(W.u.)=56 19 Mult.: from ce data in (α,2nγ).
3591.64	(1^-)	2977.85 15	100	613.727	2^+				
3603.8	2^+	2990 1	100	613.727	2^+				
3624.2	$1,2^{(+)}$	3624.1& 4	100&	0.0	0^+				
3628.1		2319.4 5	100	1308.644	2^+				
3632.2	$(1^+,2^+)$	1778.3 5		1853.927	3^+				
		1873.5 5		1758.689	0^+				
		3632 1		0.0	0^+				
3686.50	3^-	3072.71 16	100	613.727	2^+				

γ(^{78}Se) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	Comments
3704.0	(7+)	969.0 *5*	100 *8*	2735.0	(5+)	E2			B(E2)(W.u.)=36 *10* Mult.: from (α,2nγ).
		1158.7[ab] *5*	12[a]	2546.51	6+				
3711.3	(1,2,3)	3097.5 *5*	100	613.727	2+				
3735.03	0+ to 4+	3121.24 *17*	100	613.727	2+				
3830.7	8+	245.6 *2*	33 *2*	3585.0	8+	M1		0.00960	B(M1)(W.u.)=0.67 *18* Mult.: from (α,2nγ).
		1284.1 *3*	100 *6*	2546.51	6+	E2			B(E2)(W.u.)=11 *3* Mult.: from (α,2nγ).
3894.55	2+	2391.93[&] *17*	100[&] *17*	1502.825	4+				
		3893.7 *3*	5.8 *17*	0.0	0+				
3959.93	1,2(+)	3345.8 *4*	86 *15*	613.727	2+				
		3960.0 *3*	100 *15*	0.0	0+				
3999.33	1−	1672.8 *4*	74 *29*	2327.329	2+				
		2003.1 *6*	74 *29*	1995.897	2+				
		2240.1 *8*	58 *29*	1758.689	0+				
		3385.88 *21*	100 *6*	613.727	2+				
		3998.2 *3*	19 *3*	0.0	0+				
4037.01	(1−,3−)	3423.20 *21*	100	613.727	2+				
4048.0	8−	741.2 *5*	100	3306.79	6−	E2			B(E2)(W.u.)=140 *50* Mult.: from (α,2nγ).
4079.7	1,2(+)	4079.6 *3*	100	0.0	0+				
4121.2	8+	290.5 *2*	100 *11*	3830.7	8+	M1		0.00633	B(M1)(W.u.)<0.55 Mult.: from (α,2nγ).
		536.2 *2*	56	3585.0	8+	M1+E2	−0.4 *3*		B(M1)(W.u.)<0.051; B(E2)(W.u.)<70 Mult.,δ: from (α,2nγ).
		1574 *1*	78 *22*	2546.51	6+	(E2)			B(E2)(W.u.)<1.4 Mult.: ΔJ=2, (Q) from (α,2nγ). RUL and $\Delta\pi$=no from level scheme.
4181.85	0+	2186.0 *10*	59 *24*	1995.897	2+				
		2873.15 *14*	100 *11*	1308.644	2+				
4214.1	(8−)	664.0 *3*	80 *10*	3550.15	(7−)				
		1200 *1*	≈100	3013.96	6−	[E2]			B(E2)(W.u.)<5
4253.11	(2+)	2257.53 *20*	100 *20*	1995.897	2+				
		2944.20 *14*	54 *6*	1308.644	2+				
		3639.7 *5*	22 *4*	613.727	2+				
4297.38	2+	2988.67 *15*	100	1308.644	2+				
4341.61	1,2(+)	2843.02[&] *14*	114[&] *15*	1498.599	0+				
		4341.2 *3*	100 *8*	0.0	0+				
4366.61	(1)−	3057.90 *16*	100 *17*	1308.644	2+				
		4366.5 *3*	33 *11*	0.0	0+				

$^{78}_{34}$Se$_{44}$-13

γ(^{78}Se) (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	Comments
4386.68	(1,2$^+$)	2627.87& *14*	222& *29*	1758.689	0$^+$		
		3773.2 *3*	100 *11*	613.727	2$^+$		
4412.02	(9$^-$)	363.1 *4*	26 *3*	4048.0	8$^-$		
		862.0 *5*	77 *9*	3550.15	(7$^-$)		
		889.1b *1*	100	3522.91	7$^-$		
4448.24	1,2$^{(+)}$	2452.27 *16*	67 *11*	1995.897	2$^+$		
		4448.2 *3*	100 *21*	0.0	0$^+$		
4468.6	1,2$^{(+)}$	3855.0& *4*	500& *50*	613.727	2$^+$		
		4468.0 *5*	100 *25*	0.0	0$^+$		
4528.8		3220.1& *4*	100&	1308.644	2$^+$		
4625.1	(10$^+$)	794.6b *4*	<21	3830.7	8$^+$		
		1040.3 *6*	100 *24*	3585.0	8$^+$		
4672.8		4059.0 *3*	100	613.727	2$^+$		
4684.30		3375.73 *20*	48 *5*	1308.644	2$^+$		
		4070.1 *3*	100 *7*	613.727	2$^+$		
4689.8	(2$^+$)	4689.6 *3*	100	0.0	0$^+$		
4697.07	(2$^+$)	2843.02& *14*	526& *68*	1853.927	3$^+$		
		4697.2 *3*	100 *37*	0.0	0$^+$		
4723.21	2$^+$	3220.1& *4*	112& *29*	1502.825	4$^+$		
		3224.4 *5*	60 *30*	1498.599	0$^+$		
		3414.57 *21*	100 *12*	1308.644	2$^+$		
4786.9	(10$^+$)	161.9 *2*	≈87	4625.1	(10$^+$)		
		955.9 *5*	100 *9*	3830.7	8$^+$	(E2)	B(E2)(W.u.)<13
		1202.2 *6*	<13	3585.0	8$^+$	[E2]	B(E2)(W.u.)<0.3
4787.93	(1)$^-$	3479.36 *22*	72 *11*	1308.644	2$^+$		
		4173.3 *5*	100 *17*	613.727	2$^+$		
4791.5	0$^+$	4177.7 *5*	100	613.727	2$^+$		
4811.5	2$^+$	3503.6 *5*	52 *18*	1308.644	2$^+$		
		4811.1 *3*	100 *13*	0.0	0$^+$		
4819.2	(9$^-$)	1269.0 *5*	100	3550.15	(7$^-$)	[E2]	B(E2)(W.u.)=10 *4*
4857.0	(9$^+$)	1152.9 *4*	100 *6*	3704.0	(7$^+$)	[E2]	B(E2)(W.u.)=9 *4*
		1273.2b *5*	50 *13*	3585.0	8$^+$		
4957.3	1,2$^{(+)}$	4957.1 *3*	100	0.0	0$^+$		
4972.3	1$^-$	4972.1 *3*	100	0.0	0$^+$		
4998.3		3499.6 *5*	100	1498.599	0$^+$		
5004.65	1,2$^{(+)}$	3245.6& *4*	81& *24*	1758.689	0$^+$		
		4391.2 *3*	100 *10*	613.727	2$^+$		
		5003.5 *6*	19 *5*	0.0	0$^+$		
5022.14		3168.14& *17*	100&	1853.927	3$^+$		

From ENSDF

$^{78}_{34}$Se$_{44}$-14

Adopted Levels, Gammas (continued)

$\gamma(^{78}Se)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	Comments
5029.63	2^+	3720.8 *4*	100 *27*	1308.644	2^+		
		5029.5 *3*	100 *18*	0.0	0^+		
5090.8		4476.9 *3*	100	613.727	2^+		
5094.8		1046.8 *6*	100 *17*	4048.0	8^-		
5101.9		4488.0 *5*	100	613.727	2^+		
5126.52	(2,3,4)	3131.8 *4*	50 *9*	1995.897	2^+		
		3272.13 *19*	100 *14*	1853.927	3^+		
		3624.1[&] *4*	91[&] *14*	1502.825	4^+		
5164.05		3168.14[&] *17*	46[&] *8*	1995.897	2^+		
		3855.0[&] *4*	100[&] *10*	1308.644	2^+		
5180.75	$1^{(+)},2^{(+)}$	3326.4 *3*	100 *10*	1853.927	3^+		
		3682.4 *3*	76 *10*	1498.599	0^+		
5290.22	$1,2^{(+)}$	3791.7 *3*	79 *14*	1498.599	0^+		
		4676.2 *3*	100 *14*	613.727	2^+		
		5290.0 *3*	86 *14*	0.0	0^+		
5295.2	3^-	4681.3 *3*	100	613.727	2^+		
5339.7	$1,2^{(+)}$	3840.9 *3*	100 *16*	1498.599	0^+		
		4031.3 *6*	47 *6*	1308.644	2^+		
5356.51	(2^+)	3360.50 *20*	100 *14*	1995.897	2^+		
		4742.7 *3*	67 *14*	613.727	2^+		
5391.0		4777.1 *3*	100	613.727	2^+		
5440.3		4826.4 *3*	100	613.727	2^+		
5451.2	$1,2^{(+)}$	3952.5 *4*	100	1498.599	0^+		
5513.26	$1,2^{(+)}$	3245.6[&] *4*	122[&] *37*	2267.07			
		4015.0 *3*	100 *15*	1498.599	0^+		
		5512.9 *3*	35 *7*	0.0	0^+		
5689.1		902.2 *6*	100	4786.9	(10^+)		
5783.8	(12^+)	1158.7[a] *5*	100[a]	4625.1	(10^+)	[E2]	B(E2)(W.u.)<23

[†] Weighted averages of all available data. For low-spin (up to about spin 4), the values are available from ^{78}As β^- decay; ^{78}Br ε decay; (α,2nγ); (n,γ) E=thermal and (n,n′γ).

[‡] From $\gamma(\theta)$, γ(lin pol) and ce data (for a few transitions only) in (α,2nγ) for transitions from high-spin (J>4) states. The multipolarity and mixing ratios for transitions from low-spin states (J up to about 4) are from $\gamma(\theta)$, γ(circ pol) and ce measurements in (n,γ) E=thermal; and some from $\gamma(\theta)$ in (n,n′γ).

[#] γ only from (n,γ) E=thermal.

[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[&] Multiply placed with undivided intensity.

[a] Multiply placed with intensity suitably divided.

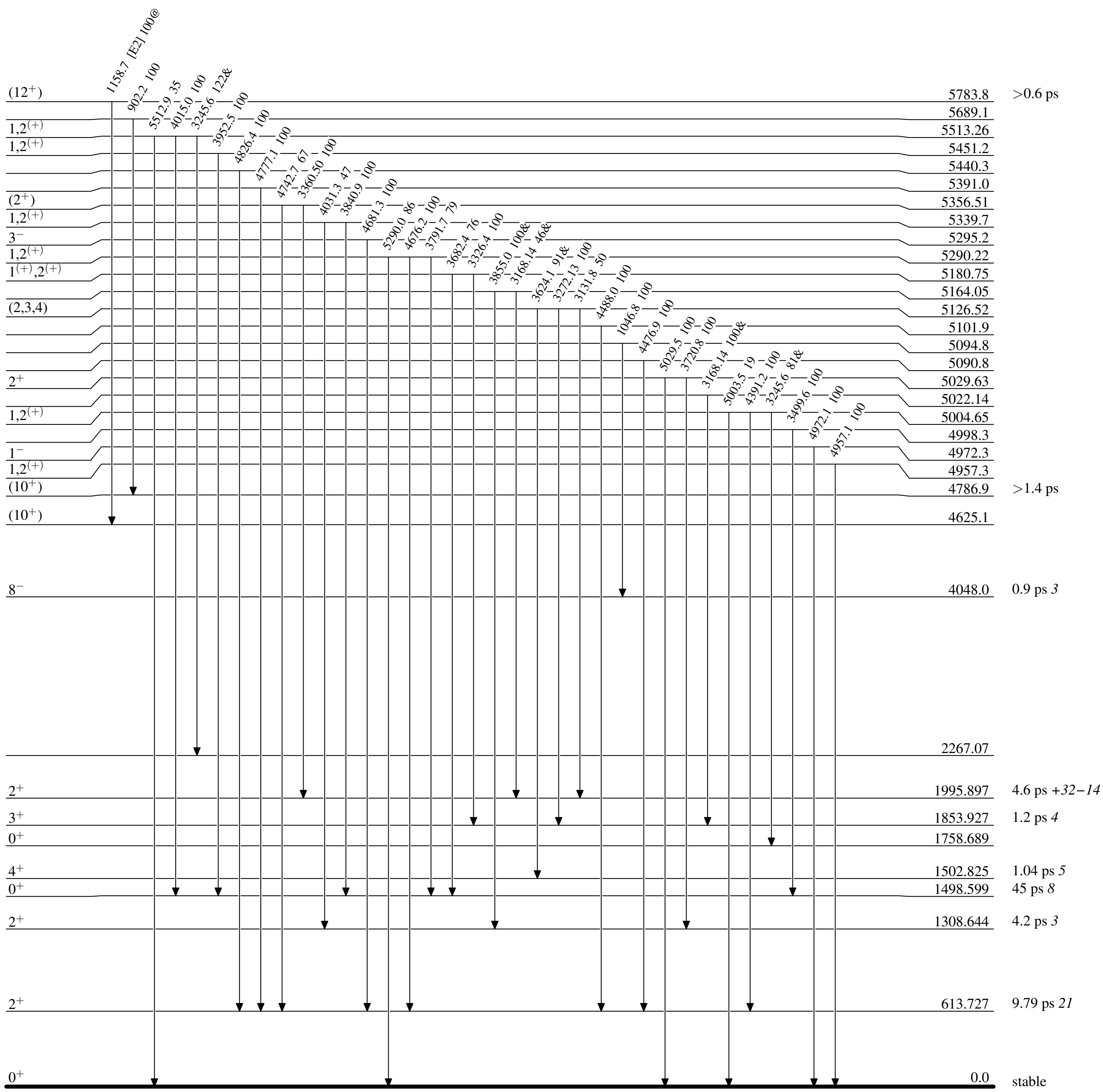
[b] Placement of transition in the level scheme is uncertain.

$^{78}_{34}Se_{44}$-15

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

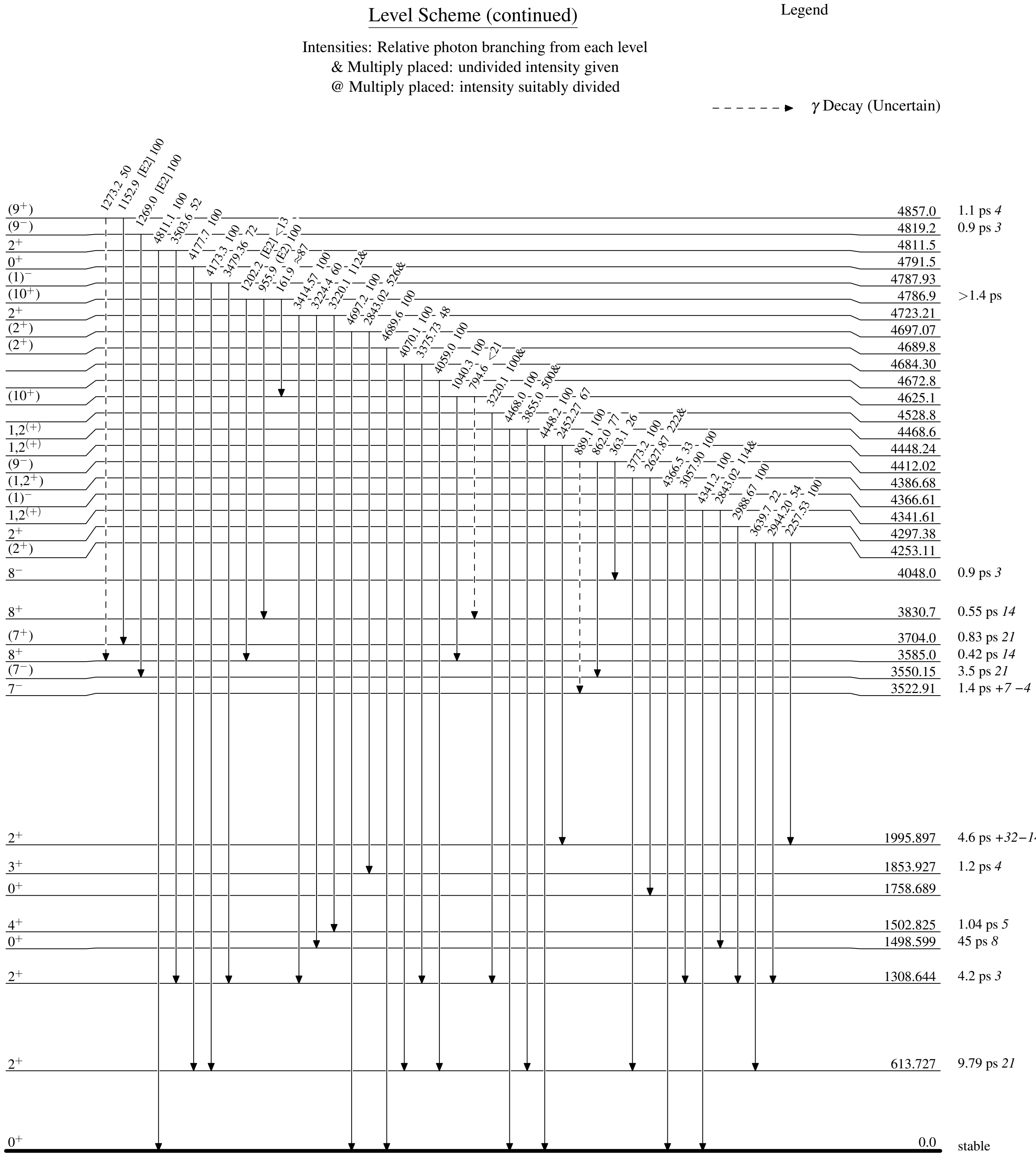


$^{78}_{34}Se_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

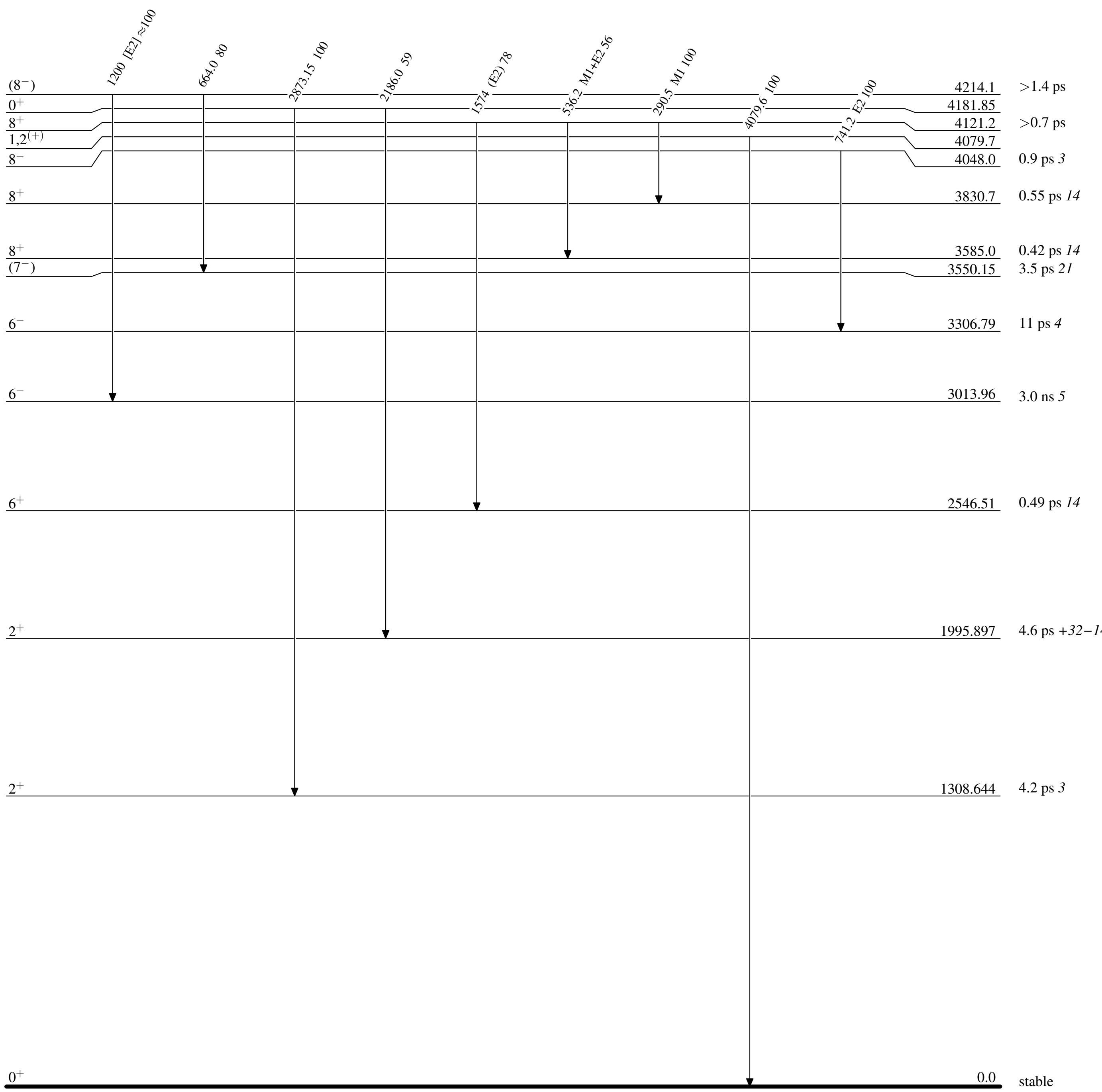


$^{78}_{34}Se_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



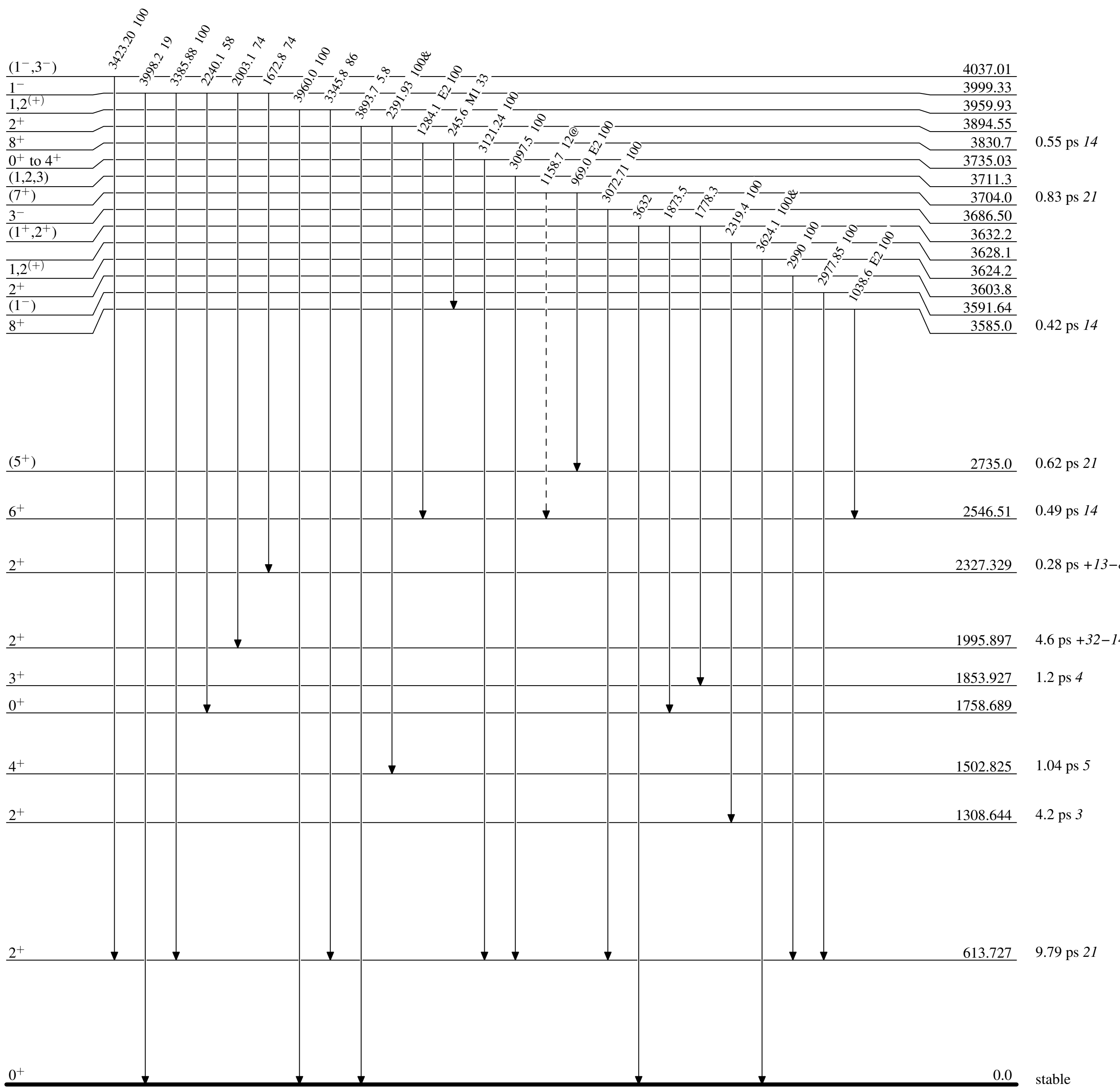
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)

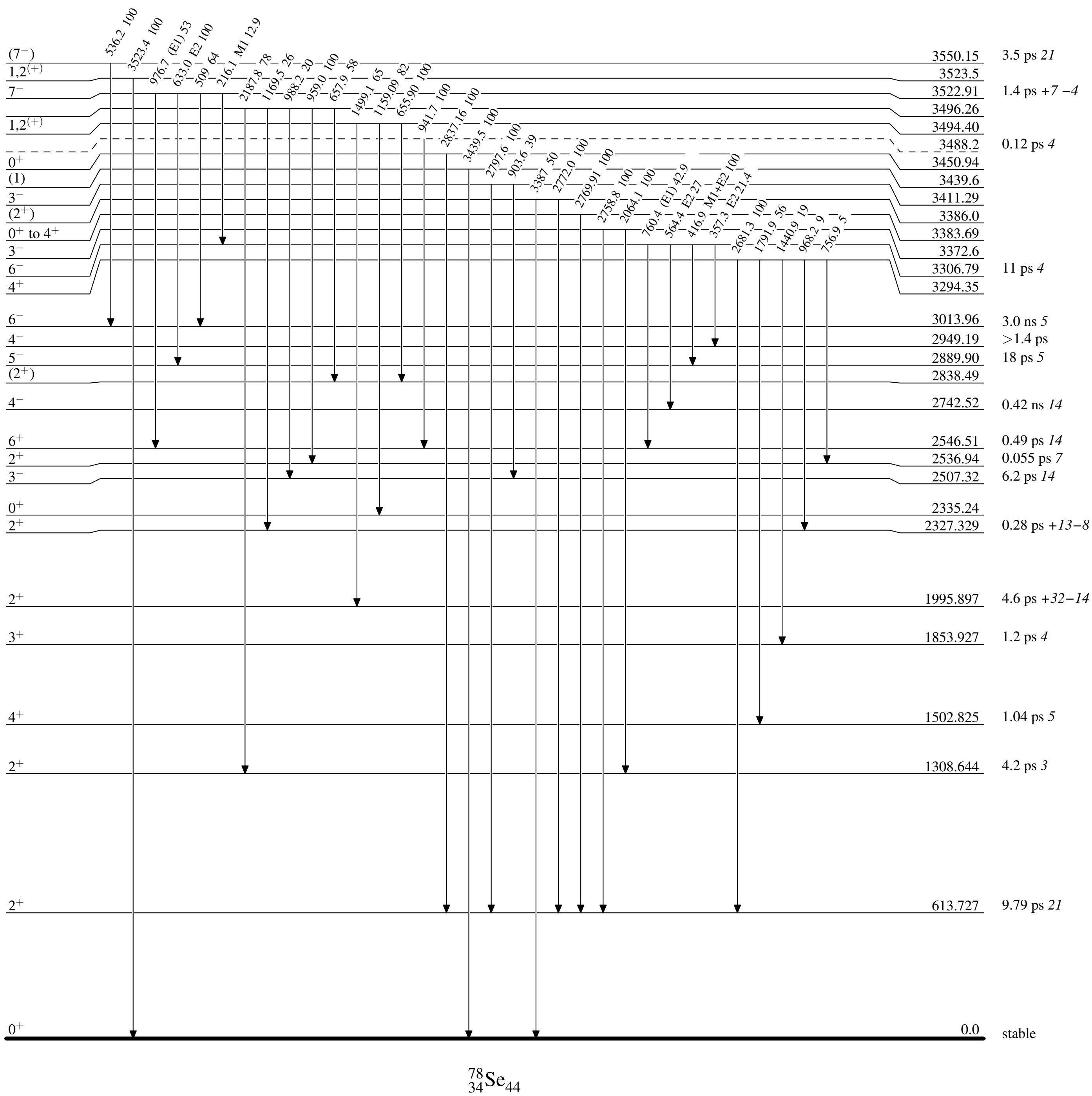


$^{78}_{34}Se_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



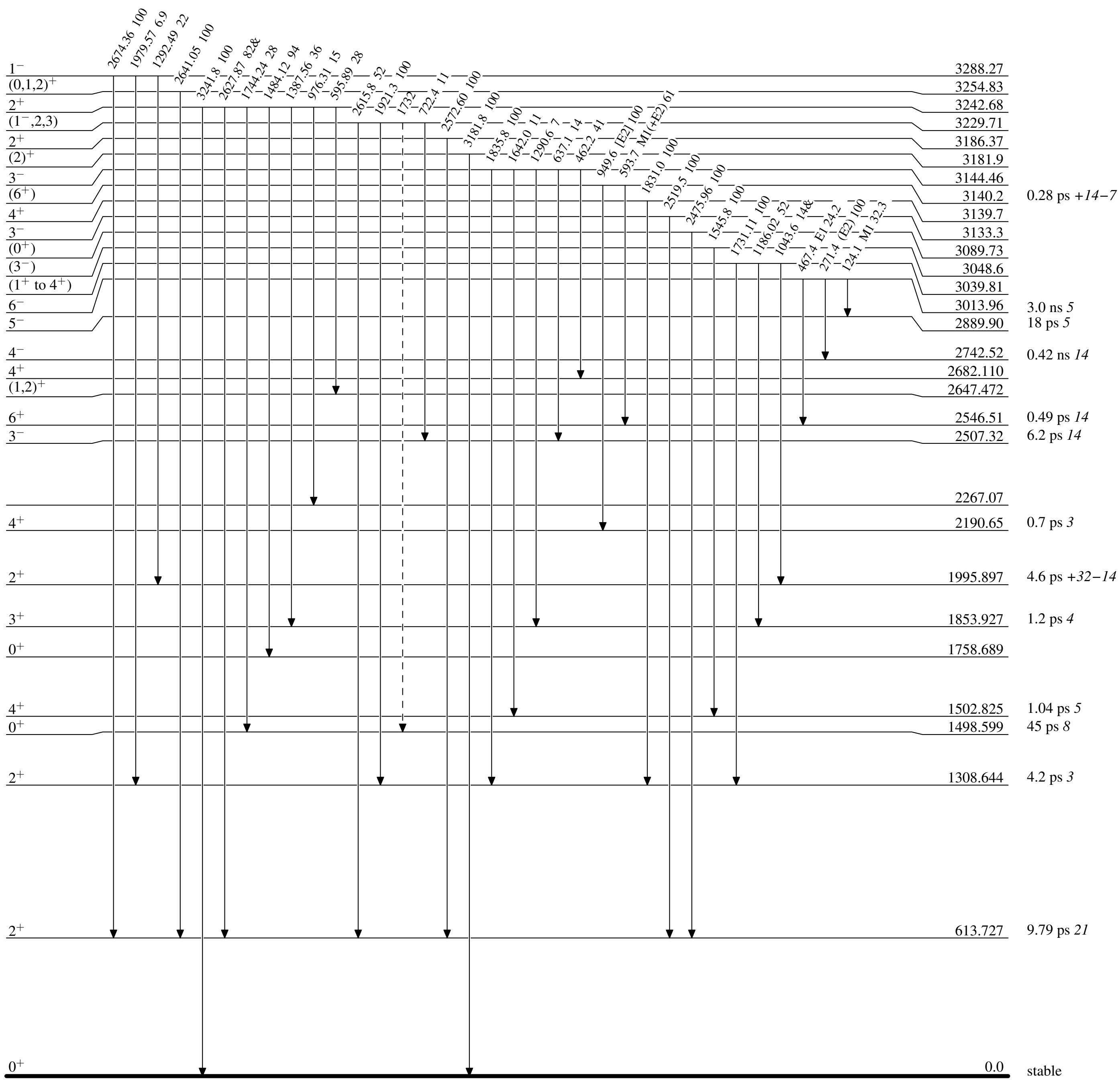
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)



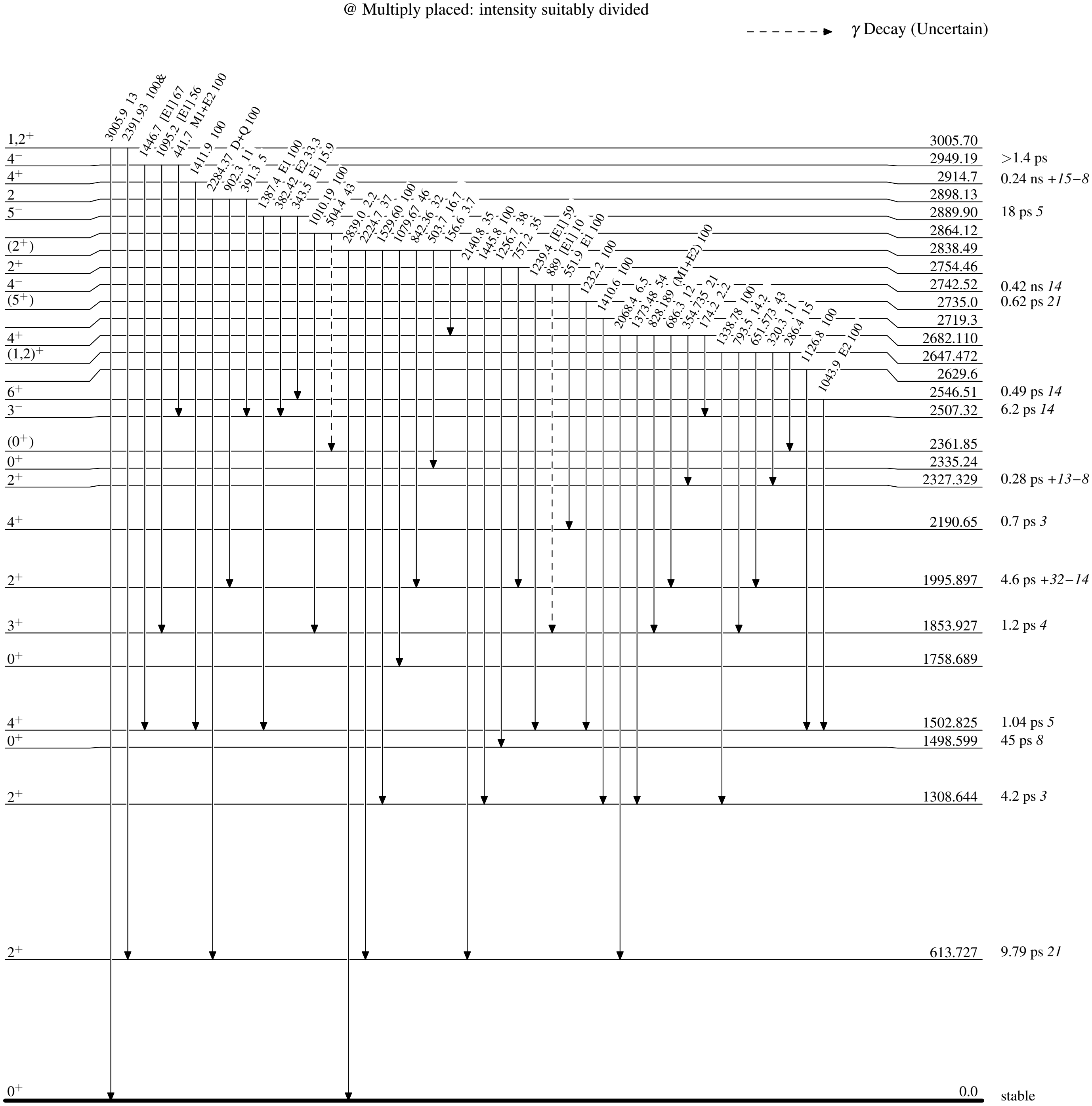
$^{78}_{34}Se_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend



$^{78}_{34}Se_{44}$

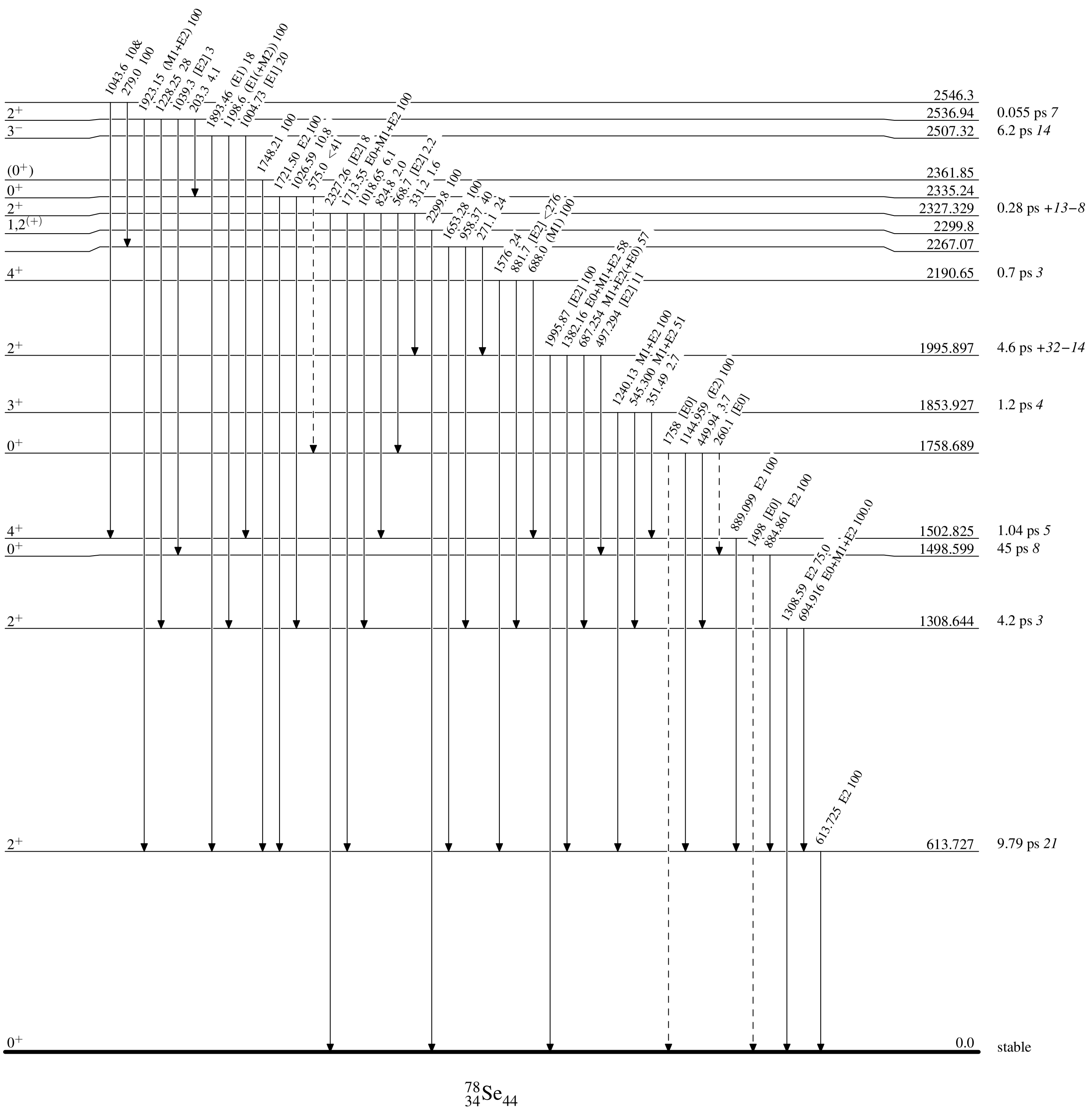
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

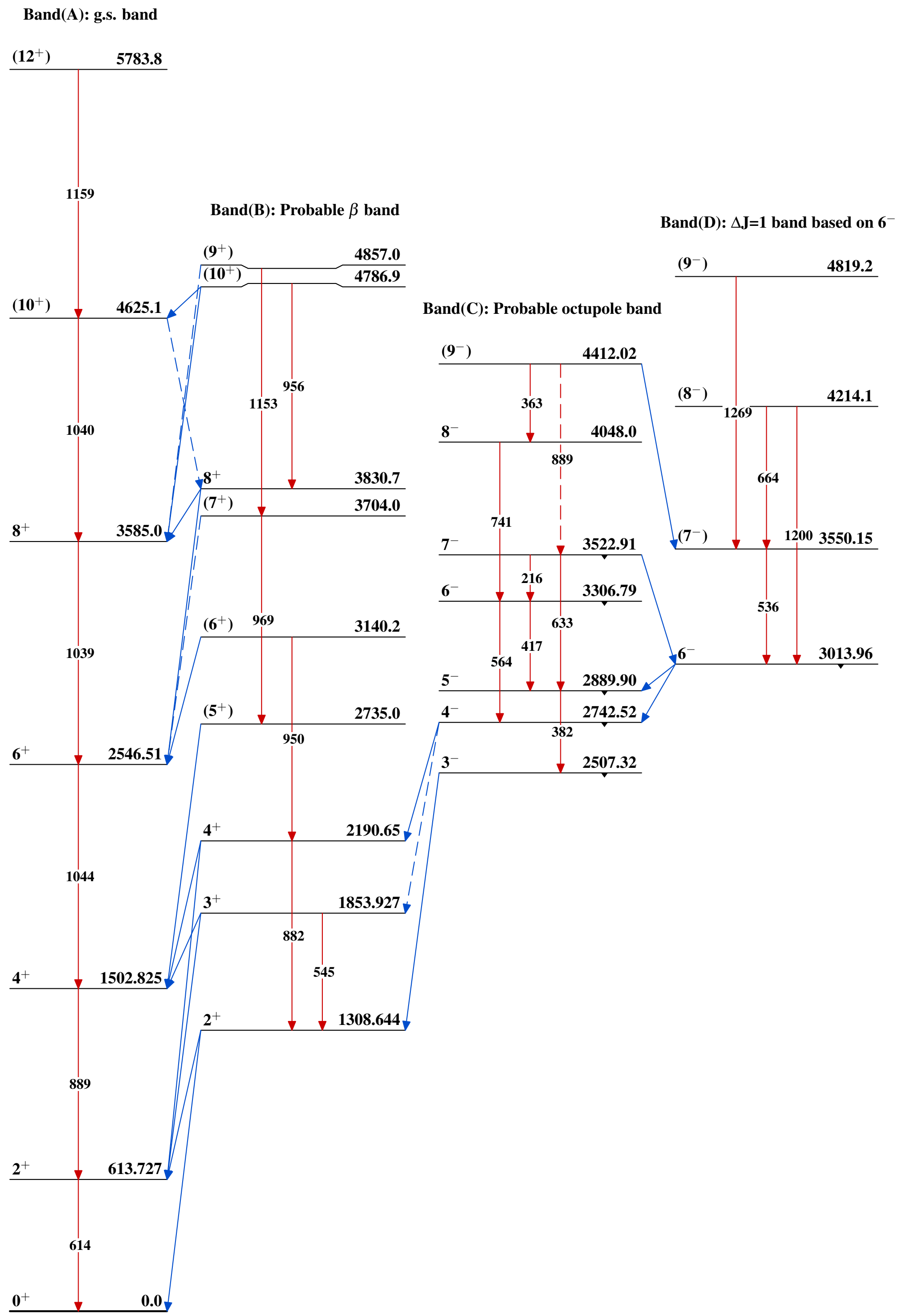
Legend

γ Decay (Uncertain)



$^{78}_{34}Se_{44}$

Adopted Levels, Gammas



$^{78}_{34}Se_{44}$

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 105,223 (2005)	22-Jun-2005

Q(β^-)=−1870.5 *4*; S(n)=9913.4 *13*; S(p)=11412 *6*; Q(α)=−6971.5 *13* 2012Wa38
Note: Current evaluation has used the following Q record $ −1870.5 *3* 9913.7 *16* 11412 *5* −6971.8 *16* 2003Au03.
Other reactions:
^{80}Se(e,e): 1988Kh02.
^{82}Se(γ,2n) GDR: 1976Ca06.
^{82}Se(n,3n): 1975FrZW.
Additional information 1.
^{80}Se(d,^{3}He): 1983Ro08 (g.s. proton occupation number for ^{80}Se).
^{79}Se(n,γ) resonances: 1979EnZZ, 1976Ca06, 1969Ma15, 1964Co31, 1962Ju01.
Mass measurements: 1985El01 (also 1984ElZY), 1977De20, 1964Ba03, 1963Ri07.
IBM description of even-even Se isotopes: 1996Ra44.
Nuclear structure theory (levels in ^{80}Se): 2004Da36.

^{80}Se Levels

Deformation parameters are available from (p,p′), (n,n′), (α,α′) and Coul. ex. datasets. Only selected values are given here. See (p,p′) for such data on many levels.

Cross Reference (XREF) Flags

A	^{80}As β^- decay (15.2 s)	F	^{80}Se(p,p′),(pol p,p′)	K	^{80}Se(α,α′)
B	Muonic atom	G	^{80}Se(p,p′γ),(α,α′γ)	L	Coulomb excitation
C	^{80}Br ε decay (17.68 min)	H	^{80}Se(n,n′)	M	^{82}Se(p,t)
D	^{78}Se(t,p)	I	^{80}Se(n,n′γ)	N	^{176}Yb(^{28}Si,Xγ),(^{30}Si,Xγ)
E	^{80}Se(γ,γ′)	J	^{80}Se(d,d′),(pol d,d)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[&]	XREF	Comments
0.0[b]	0$^+$	stable	ABCDEFGHIJKLMN	%2β^-=? <r^2>$^{1/2}$=4.1399 fm *19* (2004An14). 2β decay: theoretical calculations: 2005Do07, 2001Ka15, 2000Bo05. No experimental information is available. Additional information 2.
666.27[b] *7*	2$^+$	8.52 ps *21*	ABCDEFGHIJKLMN	B(E2)↑=0.253 *6* (2001Ra27); β_2=0.2318 *27* (2001Ra27) μ=0.87 *5* (1998Sp03) Q=−0.31 *7* (1977Le11,1989Ra17) J$^\pi$: L(t,p)=L(p,p′)=2. T$_{1/2}$: from B(E2) taken from evaluation of 2001Ra27. Other: 8.3 ps *8* (from (γ,γ′),1976KaYY). μ: transient-field technique in Coul. Ex. (1998Sp03). Other: 0.84 *24* (IMPAC in Coul. ex.,1969He11,1989Ra17). Q: reorientation effect in Coul. ex. (1977Le11). Other: −0.35 *12* (1976VoZY). β_2(p,p′)=0.21 (1993Mo05), 0.193 (1988Ba35,1986Og01), 0.22 *1* (1986MoZR), 0.229 *15* (1984De01), 0.195 *30* (1983Ma59), 0.210 *15* (1979Ma28), 0.234 (1970He10). β_2(n,n′)=0.225 (1990Go13), 0.244 *10* (1988Ba35,1984Ku09), 0.265 *20* or 0.293 *25* (1984De01), 0.25 (1979Ef01,1976La12). β_2(α,α′)=0.255 or 0.190 (1988Ba35). β_2(Coul. ex.)=0.232 *2* (1977Le11), 0.224 *2* (1974Ba80), 0.245 (1962St02).

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Adopted Levels, Gammas (continued)

^{80}Se Levels (continued)

E(level)[†]	J^π[‡]	$T_{1/2}$[&]	XREF	Comments
1449.35 *7*	2^+	1.95 ps *7*	A DEFGHIJKL	μ=0.70 *20* (1998Sp03) μ: transient-field technique in Coul. Ex. (1998Sp03). 1449 and 1479 are unresolved in (α,α'). J^π: L(p,p')=2 and $\gamma\gamma(\theta)$ in (γ,γ'). β_2(p,p')=0.047 (from β_2R=0.25 (1986Og01)), 0.082 *20* or 0.065 *5* (1986MoZR). $\beta_2(\alpha,\alpha')$=0.05 (1988Ba35). β_2(Coul. ex.)=0.054 (1974Ba80). $T_{1/2}$: other: 0.2 ps *+24−3* (DSAM in (n,n'γ)).
1478.82 *9*	0^+	11.4 ps *17*	A C EFGHIJKL	XREF: F(?). J^π: (812γ)(666γ)(θ) in ^{80}Br decay. Parity from log *ft*=5.3 *5* from 1^+.
1701.45[b] *11*	4^+	0.66 ps *2*	FGHIJKL N	μ=2.7 *10* (1998Sp03) μ: transient-field technique in Coul. Ex. (1998Sp03). J^π: L(p,p')=4. β_4(p,p')=−0.033 (from β_4R=−0.18 (1986Og01)), −0.026 *8* or −0.034 *10* (1983Ma59). Others: 1984De01, 1986MoZR. $\beta_4(\alpha,\alpha')$=0.07 or −0.02 (1988Ba35). $T_{1/2}$: other: 0.7 ps *+10−4* (DSAM in (n,n'γ)).
1873.40 *12*	$(0)^+$		A DEFG IJ	J^π: L(t,p)=0 but L(p,p')=2. $\gamma\gamma(\theta)$ in (γ,γ') gives J=0 or 2; 0^+ supported by comparison of experimental and theoretical yields in (n,n'γ).
1959.82 *9*	2^+	0.38 ps *+22−12*	A D FG IJ L	J^π: $\gamma\gamma(\theta)$ in (γ,γ') and L(p,p')=2. $T_{1/2}$: from DSAM in (n,n'γ). Other: 2.8 ps *+14−7* or 7 ps *+9−3* (from B(E2) in Coul. ex.).
2121.12 *14*	(3^+)		D FG IJ	XREF: D(2150?)J(2150). J^π: from comparison of experimental and theoretical yields in (n,n'γ).
2311.29 *9*	(2^+)	0.152 ps *+28−14*	A EFG Ij	J^π: from comparison of experimental and theoretical yields in (n,n'γ).
2344.17 *9*	$(1^+,2^+)$	0.35 ps *+17−10*	D FG Ij	J^π: L(t,p)=(2); 1^+ from comparison of experimental and theoretical yields in (n,n'γ).
2494.77 *23*	(4^+)	1.1 ps *7*	FG Ij	J^π: L(p,p')=4.
2513.57 *10*	(2^+)	0.048 ps *7*	A DEFG Ij	XREF: F(?). J^π: L(t,p)=1, but $\gamma\gamma(\theta)$ in (γ,γ') suggests J=2; 2^+ also supported from comparison of experimental and theoretical yields in (n,n'γ).
2627.40 *19*	(0^+)		E I	J^π: primary transition in (γ,γ') from $1^{(-)}$; 0^+ from comparison of experimental and theoretical yields in (n,n'γ).
2716.65 *11*	3^-	0.38 ps *14*	D FGHIJ L	B(E3)↑=0.030 *10* (2002Ki06) J^π: L(p,p')=L(t,p)=3. B(E3) adopted in evaluation by 2002Ki06 from (p,p') (1993Mo05, 1986Og01,1979Ma28). Other: B(E3)=0.0084 *14* from Coul. ex. (1974Ba80). Average β_3(from inelastic scattering)=0.154 from $\beta_3(\alpha,\alpha')$=0.161 (1988Ba35); β_3(n,n')=0.151 *10* (from b3r=0.78 *5*,1984Ku09); β_3(p,p')=0.163 (1993Mo05), 0.124 (deduced by 1988Ba35 from 1986Og01), 0.144 (deduced by 1988Ba35 from 1984De01), 0.17 *1* (1986MoZR), 0.167 (1979Ma28). β_3(from B(E3) in Coul. ex.)=0.083.
2774.3 *10*	$(1,2^+)$[@]		A	
2787? *5*			F	
2814.50 *16*	$(2^+,1^+)$		EF Ij	XREF: F(2819). J^π: 2^+ from $\gamma\gamma(\theta)$ in (γ,γ') and L(p,p')=(2); 1^+ from comparison of experimental and theoretical yields in (n,n'γ).
2825.55 *23*	(6^+)		Ij	J^π: γ to 4^+. 6^+ from comparison of experimental and

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{80}Se Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[&]	XREF	Comments
				theoretical yields in (n,n′γ).
2826.99 *11*	(2$^+$)	0.18 ps *4*	E G Ij	J^{π}: γγ(θ) in (γ,γ′) and γ to 0$^+$. Parity from reduced strength for E1 transition in (γ,γ′).
2836.3 *10*	(1,2$^+$)[@]		A j	
2895.5[b] *10*	(6$^+$)[a]		N	
2947.54 *15*	(2$^+$,4$^+$)	0.18 ps *+11−6*	F I	J^{π}: L(p,p′)=(2); 4$^+$ from comparison of experimental and theoretical yields in (n,n′γ).
2998? *5*			F	
3025.17 *16*	(1$^+$,2$^+$)[@]	0.049 ps *14*	A G I	J^{π}: 1$^+$ from comparison of experimental and theoretical yields in (n,n′γ).
3033 *4*	(4$^+$)		F J	J^{π}: L(p,p′)=4.
3036 *10*	(6$^+$)		d	J^{π}: L(t,p)=(2+6). E(level): doublet in (t,p).
3037.74 *13*	(1$^+$,2$^+$)	0.13 ps *+9−5*	d I	J^{π}: L(t,p)=(2+6) and γ to 0$^+$; 1$^+$ from comparison of experimental and theoretical yields in (n,n′γ).
3125.79 *16*	(2$^+$)[#]	0.028 ps *14*	EF I	$T_{1/2}$: from DSAM in (n,n′γ) (1989Do14); not given by 1999Ko46.
3160 *9*	0$^+$		D	J^{π}: L(t,p)=0.
3176.92 *19*	(1,2$^+$)[@]		F I	
3199.4 *3*	(2)[#]		EF I	XREF: F(?).
3224.28 *19*	(1,2)	0.070 ps *28*	I	J^{π}: γ to 0$^{(+)}$.
3226 *4*	(4$^+$)		F	J^{π}: L(p,p′)=4.
3248.3 *5*	(2$^+$)[#]		E	
3280.4 *4*	(1,2$^+$)[@]		d I	
3284 *4*	(3$^-$)		d F	J^{π}: L(p,p′)=3.
3314? *5*			F j	
3316.4 *10*	(0)[#]		EF j	XREF: F(?).
3349.95 *20*	(1$^+$)		E I	J^{π}: from γγ(θ) in (γ,γ′).
3354 *4*	(3$^-$)		D F J	XREF: J(3370). J^{π}: L(p,p′)=3 and L(t,p)=(3).
3390.75 *24*	(2$^+$)		DEF j	XREF: j(3370). J^{π}: L(t,p)=(2).
3441.88 *22*	(0$^+$)[#]		EF I	J^{π}: L(p,p′)=2 but γγ(θ) in (γ,γ′) suggests 0$^+$.
3491 *5*			D F	XREF: D(3484).
3567 *5*			F	
3606.4 *3*	(2)[#]		A E	
3619.7 *4*	(0$^+$,2$^+$)[#]		dEF	XREF: d(3635). J^{π}: L(t,p)=0 for a 3635 group suggests J^{π}=0$^+$ for 3620 or 3640 level, but L(p,p′)=(2) suggests 2$^+$.
3635.5[b] *15*	(8$^+$)[a]		N	
3640 *5*			d F	XREF: d(3635).
3655.4 *10*	(0,1,2)		E	J^{π}: primary transition from 1$^{(-)}$.
3675 *5*			F	
3727.2 *5*	(0,1,2)		A	J^{π}: log *ft*=6.1 from 1$^{(+)}$.
3753 *4*	(3$^-$)		d F j	XREF: d(3760). J^{π}: L(p,p′)=3. Also L(t,p)=(3) for a 3760 *10* group.
3774? *5*			d F j	XREF: d(3760).
3813.7 *4*	(6$^+$)		I	J^{π}: γ to 4$^+$; comparison of experimental and theoretical yields in (n,n′γ).
3814.9 *5*	(8$^+$)		I	
3826 *5*			F	
3845? *10*			F	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{80}Se Levels (continued)

E(level)[†]	J^{π}[‡]	XREF	Comments
3870.0 *4*	(1^-)	DEF	J^{π}: L(t,p)=(1).
3931 *4*	(2^+)	F	J^{π}: L(p,p′)=(2).
3951.9 *4*	(2^+)	EF	XREF: F(3960). J^{π}: L(p,p′)=(2) for a 3960 *4* group.
3976 *8*	(1^-)	D	J^{π}: L(t,p)=(1).
3996 *4*	(5^-)	F	J^{π}: L(p,p′)=5.
4039 *4*		F	
4047.1 *5*	(2^+)	D I	XREF: D(4063). J^{π}: L(t,p)=(2).
4062.2 *4*	(0^+)[#]	EF	XREF: F(?).
4129 *8*	0^+	D	J^{π}: L(t,p)=0.
4130 *4*	(3^-)	F	J^{π}: L(p,p′)=3.
4173 *4*	2^+	D F J	XREF: J(4180). J^{π}: L(t,p)=2.
4225 *4*		F	
4247 *7*	2^+	D	J^{π}: L(t,p)=2.
4295 *4*		F	
4322 *4*	(2^+)	D F	J^{π}: L(t,p)=(2).
4352 *4*	2^+	D F	J^{π}: L(t,p)=2.
4420 *4*	(2^+)	F	J^{π}: L(p,p′)=(2).
4436.6 *4*	(5^-)	F I	J^{π}: L(p,p′)=5.
4464 *5*	(1^-)	D	J^{π}: L(t,p)=1.
4511 *4*	(4^+)	F	J^{π}: L(p,p′)=4.
4570 *4*		F	
4673.5[b] *18*	(10^+)[a]	N	
4682 *4*	(4^+)	D F	XREF: D(4712). J^{π}: L(p,p′)=4.
4950 *4*		F	
4993 *4*		F	
5180 *30*		D	
5325 *4*	(3^-)	F	J^{π}: L(p,p′)=3.
7818.52 *9*	$1^{(-)}$	E	J^{π}: γ to 0^+. Parity from reduced strength for E1 transition in (γ,γ').

[†] From least-squares fit to Eγ′s for levels populated in γ-ray studies. For others weighted averages of values available from different reactions have been taken.

[‡] Above 2 MeV excitation energy, J^{π}′s deduced from L(p,p′) are given in parentheses due to high level density, ambiguity in level correspondence between different reactions, and tentative nature of L value.

[#] From $\gamma\gamma(\theta)$ in (γ,γ'). Parity is from a comparison of reduced strengths for E1 and M1 transitions with systematics of known E1 and M1 transitions in this mass region. The reduced strengths have been calculated by 1973Sz04 from relative intensities corrected for energy dependence, average level spacing and partial widths for the g.s. and the excited levels J^{π} assignments based on (γ,γ') study are considered tentative; first, because $\gamma(\theta)$ data are reported at only two angles and, second because transitions are assumed pure dipole with no quadrupole admixture.

[@] γ to 0^+.

[&] From B(E2) values in Coul. ex. for levels below 1900 keV. Above this, values are from DSA method in (n,n′γ) (1999Ko46).

[a] Systematics of yrast sequences in even-even nuclides populated in heavy-ion reactions.

[b] Band(A): Yrast sequence.

Adopted Levels, Gammas (continued)

$\gamma(^{80}Se)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[&]	δ[&]	Comments
666.27	2+	666.15 *10*	100	0.0	0+	E2[a]		B(E2)(W.u.)=24.7 *6*
1449.35	2+	783.1 *1*	66.6 *10*	666.27	2+	E2+M1	−5 *+2−6*	B(M1)(W.u.)=0.0004 *3*; B(E2)(W.u.)=18.5 *10* Mult.,δ: from $\gamma(\theta)$ in Coul. ex. δ=−0.71 *+12−17* is also possible but less likely from systematics of second 2+ states in even-even nuclei.
		1449.4 *1*	100 *3*	0.0	0+	[E2]		B(E2)(W.u.)=1.33 *7*
1478.82	0+	812.4 *1*	100	666.27	2+	E2[a]		B(E2)(W.u.)=6.9 *11*
1701.45	4+	1035.1 *1*	100	666.27	2+	E2		B(E2)(W.u.)=35.2 *11*
1873.40	(0)+	1207.1 *1*	100	666.27	2+			
1959.82	2+	1293.7 *2*	100 *5*	666.27	2+	M1+E2	−1.1 *+6−11*	δ: from M1 and E2 matrix elements in Coul. Ex. (1995Ka29). Other: −0.31 *5* or +10 *+10−2* from $\gamma(\theta)$ in (n,n′γ).
		1959.9 *1*	55 *5*	0.0	0+	[E2]		B(E2)(W.u.)=0.9 *+3−6*
2121.12	(3+)	671.7 *2*	15 *3*	1449.35	2+			
		1454.9 *2*	100 *8*	666.27	2+			
2311.29	(2+)	861.9 *1*	15 *5*	1449.35	2+			
		1645.0 *1*	100 *12*	666.27	2+	D+Q		δ: +1.95 *7* or −0.09 *+2−6* from $\gamma(\theta)$ in (n,n′γ).
2344.17	(1+,2+)	470.5 *4*	55 *9*	1873.40	(0)+			
		894.8[‡] *1*	100 *9*	1449.35	2+			
		1677.9[‡] *1*	55 *9*	666.27	2+			
		2344[‡] *1*	9.1 *18*	0.0	0+			
2494.77	(4+)	793.0 *3*	100 *30*	1701.45	4+	M1+E2	+1.1 *1*	B(M1)(W.u.)=0.012 *9*; B(E2)(W.u.)=28 *21* δ: from $\gamma(\theta)$ in (n,n′γ) and $T_{1/2}$(2495 level).
		1046[‡b]	≈3	1449.35	2+	[E2]		
		1828.8 *3*	53 *5*	666.27	2+	[E2]		B(E2)(W.u.)=0.4 *3*
2513.57	(2+)	813.3[@b] *2*		1701.45	4+			
		1035.7[b] *4*	≈40	1478.82	0+			Reported in (γ,γ') only. The placement is considered suspect since with the quoted intensity in (γ,γ'), it would have been seen in ^{80}As β^- decay and in (n,n′γ).
		1063.8 *4*	4.3 *14*	1449.35	2+			
		1847.3 *1*	100 *9*	666.27	2+			
		2513.4 *2*	4.3 *14*	0.0	0+	[E2]		B(E2)(W.u.)=0.17 *7*
2627.40	(0+)	1178.2[‡] *2*	100	1449.35	2+			
2716.65	3−	405.1 *3*	7.7 *23*	2311.29	(2+)	[E1]		B(E1)(W.u.)=0.0010 *5*
		1015.1 *2*	7.7 *15*	1701.45	4+	[E1]		B(E1)(W.u.)=6.E−5 *3*
		2050.4 *1*	100 *8*	666.27	2+	[E1]		B(E1)(W.u.)=0.00010 *4*
		(2716.6)	0.15 *7*	0.0	0+	[E3]		B(E3)(W.u.)=10 *6* I_γ: deduced (evaluator) from $T_{1/2}$ and B(E3) for 2717 level.
2774.3	(1,2+)	2774.2 *10*	100	0.0	0+			
2814.50	(2+,1+)	2148.0[‡] *3*	29 *14*	666.27	2+			
		2814.6 *2*	100 *14*	0.0	0+			E_γ: from (γ,γ'). Eγ=2817.7 in (n,n′γ).
2825.55	(6+)	1124.1 *2*	100	1701.45	4+			
2826.99	(2+)	2160.7 *1*	100 *15*	666.27	2+			
		2826.9 *3*	7.7 *24*	0.0	0+	[E2]		B(E2)(W.u.)=0.061 *25*
2836.3	(1,2+)	2836.2 *10*	100	0.0	0+			

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Se)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[&]	Comments
2895.5	(6^+)	1194		1701.45	4^+		
2947.54	$(2^+,4^+)$	826.4 *2*	50 *17*	2121.12	(3^+)		
		1498.1 *2*	100 *33*	1449.35	2^+		
		2281.4 *3*	67 *33*	666.27	2^+		
3025.17	$(1^+,2^+)$	1577.6[‡] *3*	50 *17*	1449.35	2^+		E_γ: poor fit. Level-energy difference=1575.8.
		2358.2 *2*	100 *25*	666.27	2^+		E_γ: level-energy difference=2358.86.
		3024.8 *3*	30 *20*	0.0	0^+		
3037.74	$(1^+,2^+)$	1078.6 *2*	100 *20*	1959.82	2^+		E_γ: level-energy difference=1077.9.
		1558.7 *2*	80 *20*	1478.82	0^+		
		1587.9 *2*	56 *12*	1449.35	2^+		
3125.79	(2^+)	1677.0[‡b] *5*	≈1	1449.35	2^+		
		2459.3 *2*	100	666.27	2^+		
3176.92	$(1,2^+)$	1697.8 *5*	70 *20*	1478.82	0^+		
		3176.9 *2*	100 *20*	0.0	0^+		
3199.4	(2)	3199.5[‡] *5*	100	0.0	0^+		
3224.28	(1,2)	1522.8 *2*	100 *13*	1701.45	4^+		
		1745.5 *3*	43 *22*	1478.82	0^+		
3280.4	$(1,2^+)$	2614.5 *5*	73 *21*	666.27	2^+		
		3280.0 *5*	100 *27*	0.0	0^+		
3349.95	(1^+)	3348.4 *5*	100	0.0	0^+		
3390.75	(2^+)	1909.9 *5*	100 *20*	1478.82	0^+		E_γ: poor fit. Level-energy difference=1911.9.
		1941.9 *5*	100 *20*	1449.35	2^+		
3441.88	(0^+)	1097[‡] *1*	80 *20*	2344.17	$(1^+,2^+)$		
		2775.9 *3*	100 *30*	666.27	2^+		
3606.4	(2)	2156.9[#] *5*	100 *50*	1449.35	2^+		
		2940.3[#] *10*	100 *50*	666.27	2^+		
3619.7	$(0^+,2^+)$	2953.7 *5*	100	666.27	2^+		
3635.5	(8^+)	740		2895.5	(6^+)		
3727.2	(0,1,2)	1415.9 *5*	100 *50*	2311.29	(2^+)		
		3060.8[b] *20*	50 *50*	666.27	2^+		
3813.7	(6^+)	2112.2 *3*	100	1701.45	4^+		
3814.9	(8^+)	989.3 *4*	100	2825.55	(6^+)		
3870.0	(1^-)	2391.9 *5*	100	1478.82	0^+		
3951.9	(2^+)	3286.1 *5*	100	666.27	2^+		
4047.1	(2^+)	2597.7 *5*	100	1449.35	2^+		
4062.2	(0^+)	2612.7 *5*	100	1449.35	2^+		
4436.6	(5^-)	1941.8 *3*	100	2494.77	(4^+)		
4673.5	(10^+)	1038		3635.5	(8^+)		
7818.52	$1^{(-)}$	3756.1 *4*	4.3 *4*	4062.2	(0^+)	(E1)	
		3866.9 *4*	3.0 *5*	3951.9	(2^+)		
		3949.1 *5*	3.0 *4*	3870.0	(1^-)		
		4163 *1*	1.3 *3*	3655.4	(0,1,2)		
		4199.1 *5*	2.8 *3*	3619.7	$(0^+,2^+)$		
		4212.0 *4*	3.7 *3*	3606.4	(2)		
		4376.8 *3*	5.2 *4*	3441.88	(0^+)		
		4427.1 *3*	8.5 *3*	3390.75	(2^+)	(E1)	
		4468.2 *2*	9.2 *4*	3349.95	(1^+)	(E1)	
		4502 *1*	2.2 *4*	3316.4	(0)		
		4570.1 *5*	7.3 *3*	3248.3	(2^+)	(E1)	
		4619.1 *3*	5.5 *3*	3199.4	(2)		
		4692.4 *2*	12.5 *3*	3125.79	(2^+)	(E1)	
		4991.4 *2*	12.4 *4*	2826.99	(2^+)	(E1)	
		5004.3 *5*	3.5 *3*	2814.50	$(2^+,1^+)$		
		5191.6 *4*	1.0 *3*	2627.40	(0^+)		

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Se)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[&]
7818.52	$1^{(-)}$	5304.4 *3*	6.4 *3*	2513.57	(2^+)	
		5507.2 *7*	4.2 *5*	2311.29	(2^+)	
		5858.4 *2*	27.8 *3*	1959.82	2^+	(E1)
		5944.7 *8*	1.1 *2*	1873.40	$(0)^+$	
		6339.4 *1*	9.4 *2*	1478.82	0^+	
		6369.4 *3*	8.4 *2*	1449.35	2^+	
		7818.9 *5*	100.0 *5*	0.0	0^+	(E1)

[†] Weighted averages taken when data of comparable precision are available from more than one dataset.

[‡] Reported in (n,n′γ) only.

[#] Reported in ^{80}As β^- only.

[@] Reported in (p,p′γ) only.

[&] From $\gamma(\theta)$ in (n,n′γ) and RUL deduced from $T_{1/2}$. Mult=E1 for transitions from 7819 level is from $\gamma(\theta)$ in (γ,γ') and transition strengths.

[a] From (813γ)(666γ)(θ) in ^{80}Br ε decay and $T_{1/2}$ (levels).

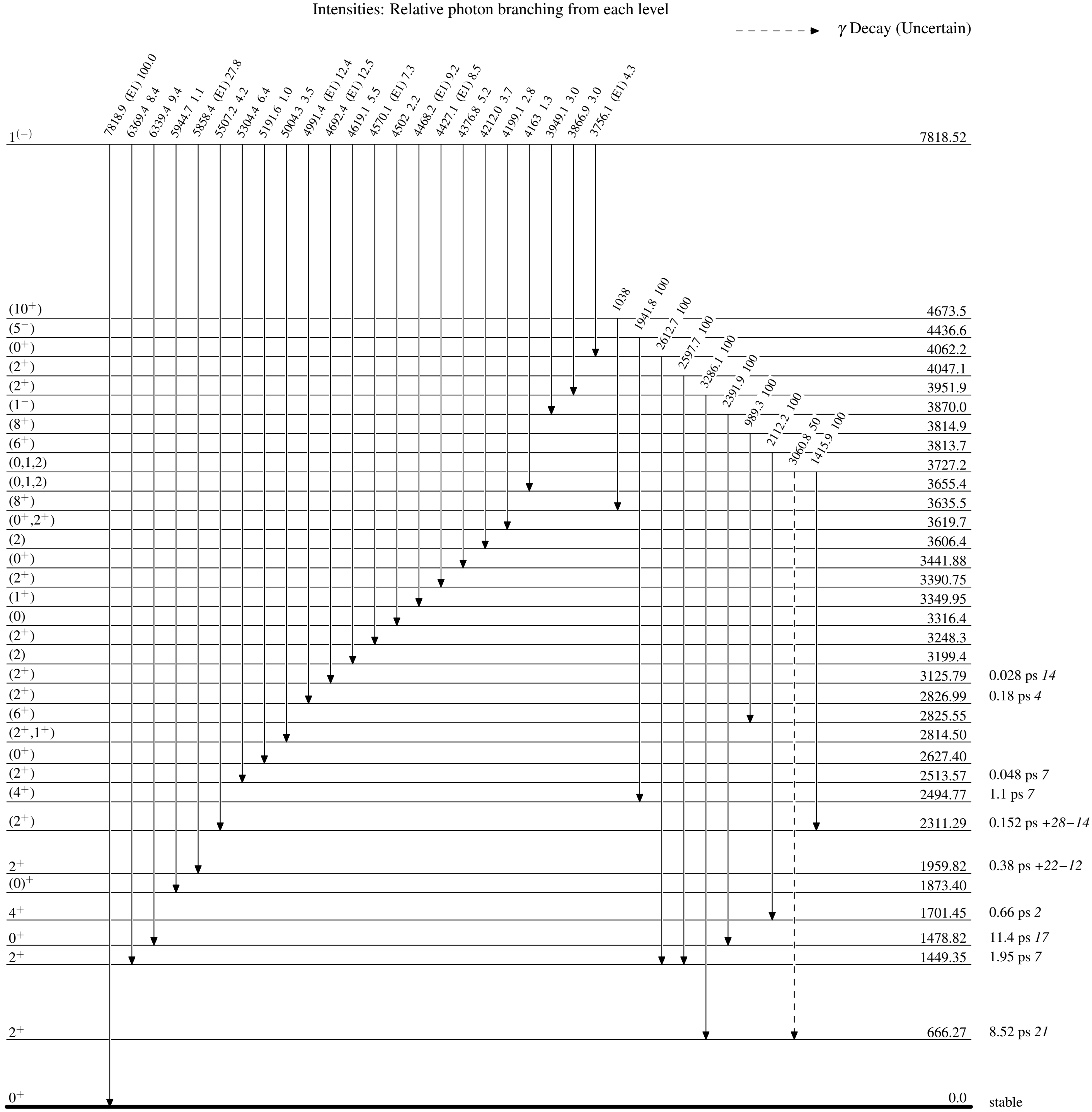
[b] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

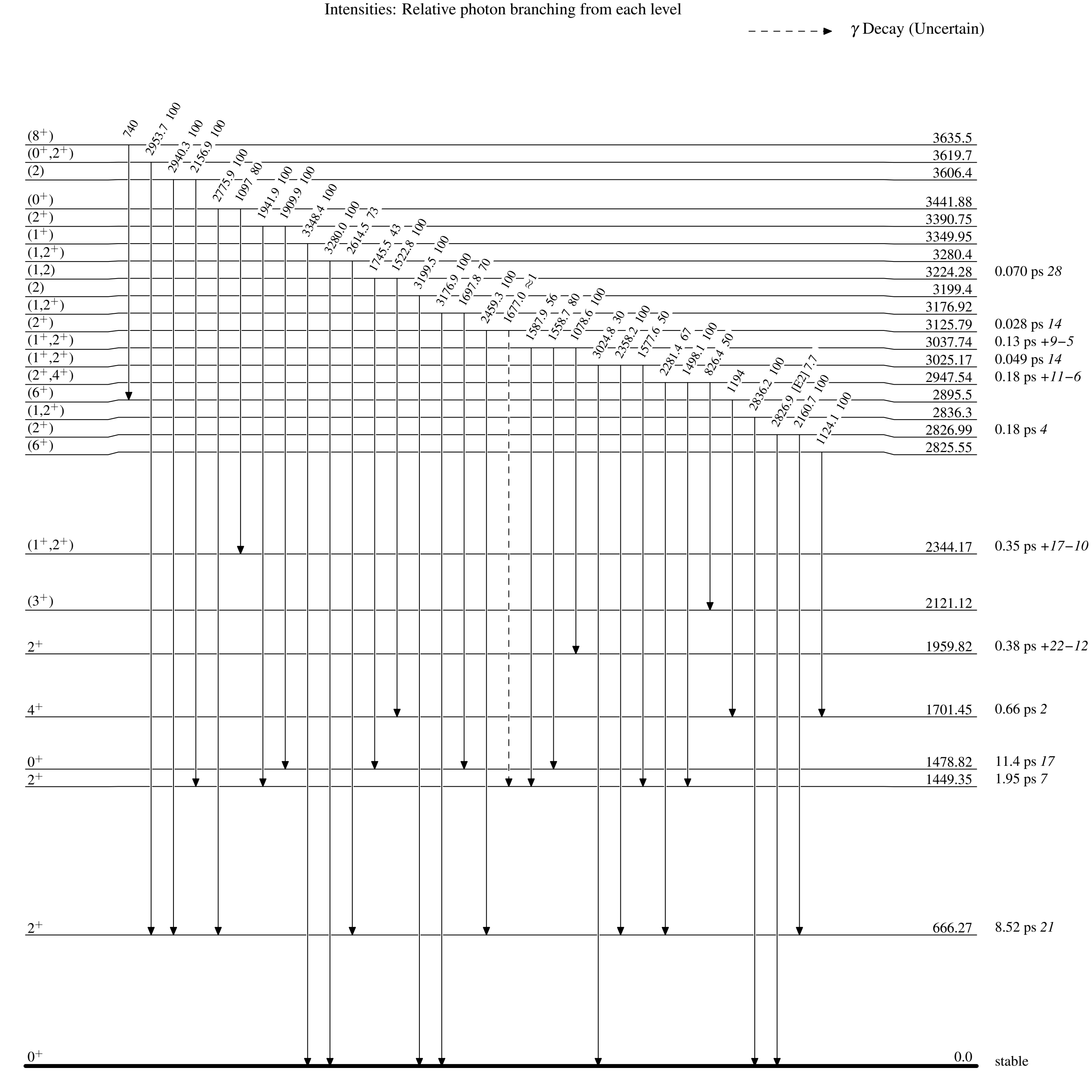


$^{80}_{34}Se_{46}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{80}_{34}Se_{46}$

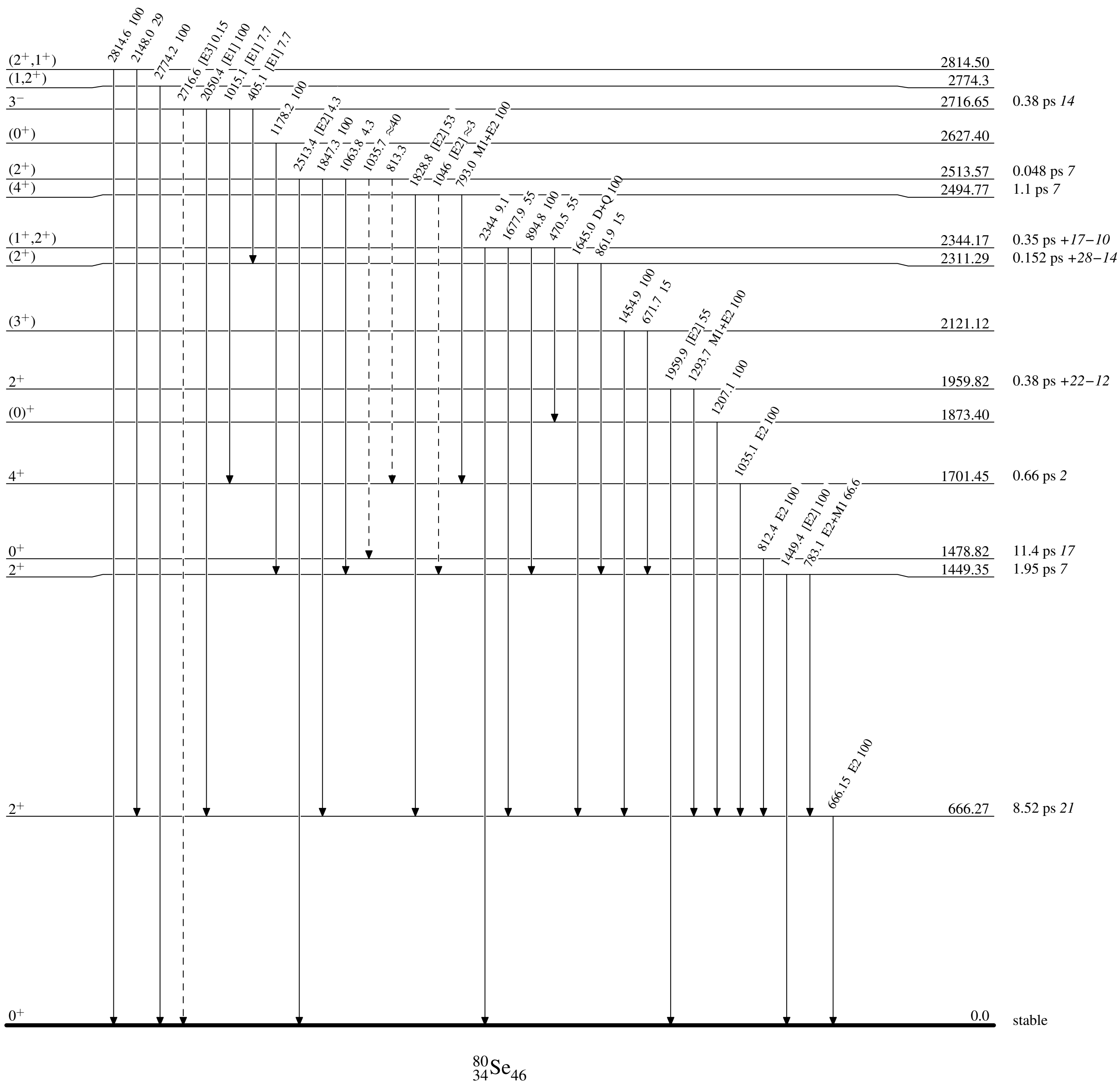
Adopted Levels, Gammas

Level Scheme (continued)

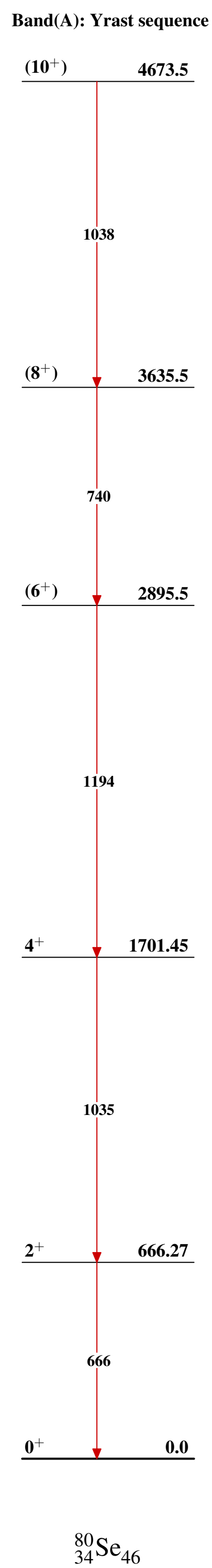
Intensities: Relative photon branching from each level

Legend

γ Decay (Uncertain)



Adopted Levels, Gammas



Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne	NDS 157, 260 (2019)	1-Mar-2019

Q(β^-)=−95.2 *11*; S(n)=9276.21 *97*; S(p)=12349.6 *27*; Q(α)=−8156.8 *36* 2017Wa10

Reference 2018Az05 compiled in XUNDL by B. Singh (McMaster), June 17, 2018.

Other reactions:

^{82}Se(pol d,d): 19887Nu03 E=12 MeV; measured dσ/dΩ and vector-analyzing power.

Se(n,n),(n,n′): 1976La12, E=6 MeV to 10 MeV. Natural and enriched targets. Measured $\sigma(\theta)$ for elastic and inelastic scattering. No individual levels were observed for inelastic scattering. 2000Za09 (1999Za09,1999Za07 same authors): Calculated s and p wave n-strength functions, s-wave scattering length 1976La12,1981Br23: Coupled-channels calculations 1990Go13: Coupled-channel analysis of $\sigma(\theta)$ for (n,n) and (n,n′) with excitation of the 2$^+$ state at E=1.5, 2.0, 2.5, 3.0, 5.0, 6.0 MeV. Others: 1984Ko09 (E=1 MeV), 1980Ko17 (slow n′s).

Theoretical calculations: 1982Ah06 (transition strengths); 1988Pe04 (Boson expansion theory).

Some (beyond 1994) Calculations for 0ν, 2ν 2β- decay $T_{1/2}$, Matrix elements, theory, study of various models: 2001St24, 2001St13, 2001Si33, 2001Ka15, 2001Fa10, 2000Ve05, 2000Su06, 2000Ra13, 2000Pa47, 2000Pa25, 2000Ki24, 2000Fa14, 2000Cl02, 2000Bo05, 2000Ba68, 2000Ba54, 1999Si18, 1999Ca62, 1999Ba38, 1998Ba05, 1998Su22, 1998Su19, 1998Sc11, 1998Ru08, 1998Kl25, 1998Kl18, 1998Kl10, 1998Fa19, 1998Fa17, 1998Be49, 1998Ba76, 1998Ba55, 1998Au04, 1997To05, 1997Ra09, 1997Kr01, 1997Ej01, 1997Ba19, 1996Si29, 1996Sc09, 1996Ru21, 1996Ru04, 1996Pa02, 1996Mo23, 1996Hi06, 1996Hi04, 1996Ej02, 1996Ca35, 1996Ca35, 1996Au07, 1995Ru18, 1995Ba17.

See 1981MuZQ for neutron resonances.

^{82}Se Levels

Q value for 2β^- decay=2997.9 keV *5* (2017Wa10).

Cross Reference (XREF) Flags

A	^{82}As β^- decay (13.6 s)	E	^{82}Se(p,p′γ)	I	^{82}Se IT decay (6.6 ns)
B	^{82}As β^- decay (19.1 s)	F	Coulomb excitation	J	(HI,xnγ)
C	^{80}Se(t,p)	G	^{82}Se(d,d′)		
D	^{82}Se(p,p′),(pol p,p′)	H	^{82}Se(n,n′γ)		

E(level)†	J$^\pi$	$T_{1/2}$‡	XREF	Comments
0#	0$^+$	9.6×10^{19} y *10*	ABCDEFGHIJ	%2β^-=100 $T_{1/2}$: From 2012Si23 for $T_{1/2}$(2ν2β-)(^{82}Se 0$^+$ to 0$^+$) other values: 0.83×10^{20} y *+9−7* (1999Pi08,1999Sa02), 10.8×10^{20} y *+26−6* from 1992El07 (see also 1987El11, 1987El10, 1986El01), 1.2×10^{20} y *1* from geochemical measurements (1988Li11); 1.0×10^{20} y *4* (1985Ma57), 2.8×10^{20} y *9* (1973Sr05), 1.4×10^{20} y *3* (1970Ki21), all from isotopic anomaly of ^{82}Kr in geological samples, 0.9×10^{20} y *1* (2002Ba52). $T_{1/2}$: $T_{1/2}$(0ν2β-)(^{82}Se 0$^+$ to 0$^+$)>3.2×10^{23} y (90% confidence level); (2012Si23);>2.4×10^{21} y (1999Sa02,2000Ar16, 2001Va34) other:>2.7×10^{22} y (1993Mo36). Calculated $T_{1/2}$ (2002Su13,2002Si12). $T_{1/2}$: >2.4E24 y lower limit for 0$\nu\beta\beta$ decay mode (2018Az05); measured at 90% credible interval, from a maximum likelihood analysis of events in the 2800-3200 keV region. This half-life can be compared with $T_{1/2}$>3.6×10^{23} y, obtained using NEMO detector with a larger ^{82}Se exposure of ≈3.5 kg y (2011Ba55). From the half-life limit, deduced effective Majorana neutrino mass of <(376-770) meV, depending on the nuclear matrix element calculations (2018Az05).

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Adopted Levels, Gammas (continued)

^{82}Se Levels (continued)

E(level)†	J$^\pi$	T$_{1/2}$‡	XREF	Comments
654.71# *16*	2$^+$	12.8 ps *7*	ABCDEFGHIJ	μ=+0.99 *6*(1978Br38,2014StZZ); Q=−0.22 *7* (1977Le11,2016St14) J$^\pi$: from angular distribution and vector-analyzing power in (pol p,p′) (1984De01). T$_{1/2}$: from 2016Pr01,deduced from B(E2).
1410.22 *17*	0$^+$	30 ps	BCDEF H	J$^\pi$: L(t,p)=0. T$_{1/2}$: from B(E2) deduced from Coulomb excitation.
1731.51 *10*	2$^+$	0.94 ps *11*	AB DEFgH J	J$^\pi$: L(t,p)=2+4, L(p,p′)=2+4 for the unresolved 1731+1735 doublet. log *ft*=7.0 from (1$^+$) and γ to 0$^+$ indicate that this is the 2$^+$ member of 1731+1735 doublet. T$_{1/2}$: from B(E2) deduced from Coulomb excitation.
1735.10# *24*	4$^+$	0.96 ps *15*	ABCDEFgHIJ	μ=2.3 *15* (1998Sp03,2014StZZ) J$^\pi$: see 1731.51 level. T$_{1/2}$: from B(E2) in Coul ex, other: 0.95 ps *25* in (n,n′γ).
2550.28 *16*	(4$^+$)	1.7@ ps *3*	A CDEF H J	J$^\pi$: γ to 2$^+$; γ from (4$^-$,5$^-$). J$^\pi$ suggested in (HI,xnγ), Coul. Ex.
2624.1 *4*	(0$^+$)	0.04 ps *1*	B E H	J$^\pi$: from level feeding calculations in (n,n′γ) (1998Ko52).
2893.66 *18*	5$^-$	>131.7@ ps	A CD H J	J$^\pi$: L(p,p′)=5.
3009.14 *19*	3$^-$	0.020 ps *5*	BCDE H	J$^\pi$: from angular distribution and vector-analyzing power in (pol p,p′).
3103.3 *4*	(4$^+$)		CD H	J$^\pi$: L(p,p′)=4; in conflict to this L(t,p)=(5). (n,n′γ) supports adopted J$^\pi$.
3144.8# *5*	6$^+$	0.39@ ps *+13−9*	IJ	J$^\pi$: assumed stretched E2 cascade.
3238.78 *21*	(4$^+$)	0.30 ps *+12−8*	D H	XREF: D(3293). J$^\pi$: L(p,p′)=4. E(level): 1998Ko52 did not find a level at 3293, but saw a level at 3238 with similar J$^\pi$.
3378.44 *24*	(3$^-$)	0.12 ps *4*	D H	XREF: D(3384). J$^\pi$: L(p,p′)=3.
3445.9 *4*	0$^+$		C H	XREF: C(3449). J$^\pi$: L(t,p)=0+(5). See also 3454 level.
3454.15 *20*	(5$^-$)		A H	J$^\pi$: log *ft*=5.5 from (5$^-$). γ to (3,4$^+$). L(t,p)=0+(5) at 3449 keV. Note, however, that the angular momentum of the L=5 admixture is more speculated than established.
3517.8# *5*	8$^+$	6.6 ns *4*	IJ	%IT=100 J$^\pi$: From (HI,xnγ) assumed stretched E2 cascade. Expected Configuration=(ν g$_{9/2}$)$^{-2}$. Systematics of 8$^+$ isomers In N=48 nuclides (1999Ma21,2002Is03). T$_{1/2}$: from IT decay (1999Ma21).
3591.67 *20*	2$^+$	0.28 ps *+12−8*	CD H	XREF: C(3586). J$^\pi$: L(t,p)=2.
3631.26 *21*	(0$^+$)		D H	XREF: D(3624). J$^\pi$: from level feeding calculations In (n,n′γ) (1998Ko52).
3664.0 *4*	2$^+$		C H	J$^\pi$: L(t,p)=2.
3667.5 *3*	(1,2$^+$)		B	J$^\pi$: log *ft*=6.2 from (2$^-$) and γ to 0$^+$.
3688.9 *6*	(4$^+$)		D H	XREF: D(3677). J$^\pi$: L(p,p′)=4.
3757.0 *5*	2$^+$		CD H	XREF: D(3750). J$^\pi$: L(t,p)=2.
3794.9 *5*	(7$^-$)		J	
3798? *4*	(4$^+$)		D	J$^\pi$: L(p,p′)=4. E(level): level not seen in (n,n′γ) and other studies.
3831.0 *6*	0$^+$		C H	J$^\pi$: L(t,p)=0.
3865.06 *25*	(3$^-$)		D H	J$^\pi$: L(p,p′)=3.
3917.9 *6*	2$^+$		CD H	J$^\pi$: L(t,p)=2.
4034.5 *4*	2$^+$	0.17 ps *+10−5*	CD H	XREF: D(4026).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{82}Se Levels (continued)

E(level)†	J$^\pi$	T$_{1/2}$‡	XREF	Comments
				J$^\pi$: L(t,p)=2.
4088.0 *4*	(4$^-$,5$^-$)		A	J$^\pi$: log *ft*=5.5 from (5$^-$). γ to (3,4$^+$).
4094.3 *3*	(5$^-$)		H	J$^\pi$: J=5 from (n,n′γ) calculations (1998Ko52).
4134 *6*	2$^+$		C	J$^\pi$: L(t,p)=2.
4231.8 *9*			J	
4244.98 *20*	(1$^-$)		B	J$^\pi$: log *ft*=5.4 from (2$^-$), γ to 0$^+$, 2$^+$.
4391.3 *4*	2$^+$	0.13 ps *3*	C H	J$^\pi$: L(t,p)=2.
4466 *4*	(4$^+$)		C	J$^\pi$: L(t,p)=(4).
4535 *7*	(4$^+$)		CD	XREF: C(4518). J$^\pi$: L(t,p)=(4).
4584 *4*	(4$^+$)		CD	J$^\pi$: L(t,p)=(4).
4809 *13*	(1$^-$)		C	J$^\pi$: L(t,p)=(1).
4881 *13*	(4$^+$)		C	J$^\pi$: L(t,p)=(4).
4969 *11*			C	
4983.3 *8*	(9$^+$)		J	J$^\pi$: from (HI,xnγ).
5029 *12*	(1$^-$)		C	J$^\pi$: L(t,p)=(1).
5046.3 *12*			J	
5192.0 *10*			J	
5457.0# *8*	(10$^+$)	<1.04@ ps	J	J$^\pi$: from (HI,xnγ).
5687.0 *9*	(11)		J	J$^\pi$: from (HI,xnγ).
6128.9 *10*	(12)		J	J$^\pi$: from (HI,xnγ).

† Levels connected by γ's to the g.s. are calculated from the adopted gammas using least-squares fit. Others are from (p,p′), (t,p), or weighted averages of both.

‡ From DSA in (n,n′γ), unless indicated otherwise.

Band(A): Yrast sequence (2009Po04).

@ From 2018Li20, recoil-distance DSA.

γ(^{82}Se)

E$_i$(level)	J$^\pi_i$	E$_\gamma$†	I$_\gamma$†	E$_f$	J$^\pi_f$	Mult.	α@	Comments
654.71	2$^+$	654.7 *5*	100	0	0$^+$	[E2]	1.25×10^{-3}	α(K)=0.001111 *16*; α(L)=0.0001181 *17*; α(M)=1.84×10^{-5} *3* α(N)=1.553×10^{-6} *22* B(E2)(W.u.)=17.3 *10*
1410.22	0$^+$	755.6 *1*	100	654.71	2$^+$	[E2]	8.46×10^{-4}	α(K)=0.000753 *11*; α(L)=7.96×10^{-5} *12*; α(M)=1.238×10^{-5} *18* α(N)=1.050×10^{-6} *15* B(E2)(W.u.)=3.62
1731.51	2$^+$	1076.4 *4*	26 *5*	654.71	2$^+$	[E2]	3.55×10^{-4}	α(K)=0.000316 *5*; α(L)=3.30×10^{-5} *5*; α(M)=5.14×10^{-6} *8* α(N)=4.38×10^{-7} *7* B(E2)(W.u.)=4.1 *10* E$_\gamma$: from β^- decay.
		1731.5 *1*	100 *5*	0	0$^+$	[E2]	3.15×10^{-4}	α(K)=0.0001172 *17*; α(L)=1.211×10^{-5} *17*; α(M)=1.88×10^{-6} *3* α(N)=1.613×10^{-7} *23*; α(IPF)=0.000184 *3* B(E2)(W.u.)=1.45 *21*
1735.10	4$^+$	1079.8 *5*	100	654.71	2$^+$	[E2]	3.52×10^{-4}	B(E2)(W.u.)=19 *3* α(K)=0.000314 *5*; α(L)=3.28×10^{-5} *5*; α(M)=5.10×10^{-6} *8* α(N)=4.35×10^{-7} *7*

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Adopted Levels, Gammas (continued)

$\gamma(^{82}Se)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult.	α @	Comments
2550.28	(4+)	815.1 *2*	52 *13*	1735.10	4+			
		818.6 *2*	91 *13*	1731.51	2+	[E2]	6.87×10^{-4}	α(K)=0.000612 *9*; α(L)=6.45×10^{-5} *9*; α(M)=1.003×10^{-5} *14* α(N)=8.52×10^{-7} *12* B(E2)(W.u.)=16 *4*
		1895.5 *1*	100 *9*	654.71	2+	[E2]	3.70×10^{-4}	α(K)=9.88×10^{-5} *14*; α(L)=1.019×10^{-5} *15*; α(M)=1.586×10^{-6} *23* α(N)=1.358×10^{-7} *19*; α(IPF)=0.000259 *4* B(E2)(W.u.)=0.26 *6*
2624.1	(0+)	1969.4 *3*	100	654.71	2+	[E2]	3.98×10^{-4}	α(K)=9.21×10^{-5} *13*; α(L)=9.49×10^{-6} *14*; α(M)=1.476×10^{-6} *21* α(N)=1.265×10^{-7} *18*; α(IPF)=0.000295 *5* B(E2)(W.u.)=23 *6*
2893.66	5−	343.3‡ *1*	100‡ *17*	2550.28	(4+)			
		1158.3‡ *8*	10‡ *3*	1735.10	4+			
3009.14	3−	2354.4 *1*	100	654.71	2+	[E1]	9.10×10^{-4}	α(K)=3.94×10^{-5} *6*; α(L)=4.03×10^{-6} *6*; α(M)=6.27×10^{-7} *9* α(N)=5.38×10^{-8} *8*; α(IPF)=0.000865 *13* B(E1)(W.u.)=0.0014 *4*
3103.3	(4+)	1368.2 *2*	100	1735.10	4+			
3144.8	6+	1409.7‡ *4*	‡	1735.10	4+	[E2]	2.53×10^{-4}	α(K)=0.0001763 *25*; α(L)=1.83×10^{-5} *3*; α(M)=2.85×10^{-6} *4* α(N)=2.43×10^{-7} *4*; α(IPF)=5.55×10^{-5} *8* B(E2)(W.u.)=12 *+3−5*
3238.78	(4+)	1507.3 *3*	75 *19*	1731.51	2+	[E2]	2.61×10^{-4}	α(K)=0.0001539 *22*; α(L)=1.594×10^{-5} *23*; α(M)=2.48×10^{-6} *4* α(N)=2.12×10^{-7} *3*; α(IPF)=8.82×10^{-5} *13* B(E2)(W.u.)=4.9 *+19−24*
		2584.0 *2*	100 *10*	654.71	2+	[E2]	6.55×10^{-4}	α(K)=5.69×10^{-5} *8*; α(L)=5.85×10^{-6} *9*; α(M)=9.10×10^{-7} *13* α(N)=7.80×10^{-8} *11*; α(IPF)=0.000591 *9* B(E2)(W.u.)=0.44 *+14−19*
3378.44	(3−)	1646.9 *3*	96 *20*	1731.51	2+	[E1]	4.44×10^{-4}	α(K)=6.77×10^{-5} *10*; α(L)=6.94×10^{-6} *10*; α(M)=1.079×10^{-6} *16* α(N)=9.25×10^{-8} *13*; α(IPF)=0.000368 *6* B(E1)(W.u.)=0.00033 *14*
		2723.7 *3*	100 *10*	654.71	2+	[E1]	1.12×10^{-3}	α(K)=3.21×10^{-5} *5*; α(L)=3.28×10^{-6} *5*; α(M)=5.10×10^{-7} *8* α(N)=4.38×10^{-8} *7*; α(IPF)=0.001086 *16* B(E1)(W.u.)=8.E−5 *3*
3445.9	0+	1714.4 *3*	100	1731.51	2+			
3454.15	(5−)	560.5 *1*	100 *20*	2893.66	5−			
		903.7 *3*	20 *4*	2550.28	(4+)			
3517.8	8+	373.0 *2*	100	3144.8	6+	[E2]	0.00706	α(K)=0.00626 *9*; α(L)=0.000687 *10*; α(M)=0.0001067 *15* α(N)=8.88×10^{-6} *13* B(E2)(W.u.)=0.56 *4*
3591.67	2+	1859.9 *2*	100 *17*	1731.51	2+	[E2]	3.57×10^{-4}	α(K)=0.0001024 *15*; α(L)=1.056×10^{-5} *15*; α(M)=1.643×10^{-6} *23* α(N)=1.407×10^{-7} *20*; α(IPF)=0.000242 *4* B(E2)(W.u.)=3.3 *+12−16*
		2182.0 *3*	16.7 *17*	1410.22	0+	[E2]	4.84×10^{-4}	α(K)=7.65×10^{-5} *11*; α(L)=7.87×10^{-6} *11*; α(M)=1.224×10^{-6} *18*

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Adopted Levels, Gammas (continued)

$\gamma(^{82}Se)$ (continued)

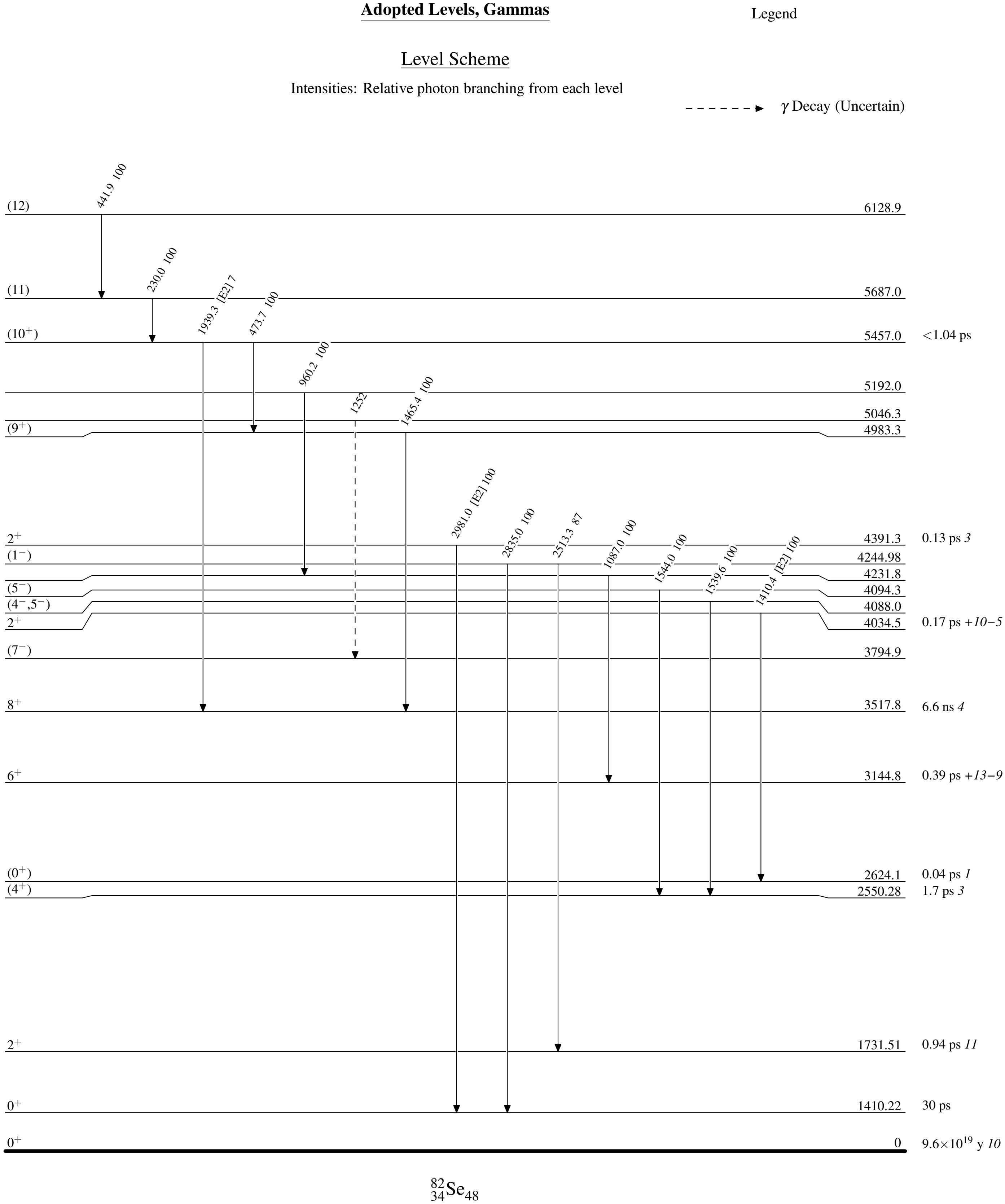
E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	α@	Comments
								$\alpha(N)=1.049\times10^{-7}$ *15*; $\alpha(IPF)=0.000398$ *6* B(E2)(W.u.)=0.25 *+9−12*
3591.67	2^+	3591 *1*	12 *5*	0	0^+	[E2]	1.05×10^{-3}	$\alpha(K)=3.33\times10^{-5}$ *5*; $\alpha(L)=3.41\times10^{-6}$ *5*; $\alpha(M)=5.30\times10^{-7}$ *8* $\alpha(N)=4.55\times10^{-8}$ *7*; $\alpha(IPF)=0.001017$ *15* B(E2)(W.u.)=0.015 *+8−10*
3631.26	(0^+)	1899.7 *3*	67 *14*	1731.51	2^+			
		2976.5 *2*	100 *20*	654.71	2^+			
3664.0	2^+	1113.7 *3*	100 *17*	2550.28	(4^+)			
		3009 *1*	33 *9*	654.71	2^+			
3667.5	$(1,2^+)$	3667.4# *3*	100#	0	0^+			
3688.9	(4^+)	3034.1 *5*	100	654.71	2^+			
3757.0	2^+	2346 *1*	32 *11*	1410.22	0^+			
		3102.4 *5*	100 *11*	654.71	2^+			
3794.9	(7^-)	901.2‡ *4*	100‡	2893.66	5^-			
3831.0	0^+	3176.2 *5*	100	654.71	2^+			
3865.06	(3^-)	970.4 *3*	100 *17*	2893.66	5^-			
		2134.5 *3*	83 *9*	1731.51	2^+			
3917.9	2^+	3263.1 *5*	100	654.71	2^+			
4034.5	2^+	1410.4 *2*	100	2624.1	(0^+)	[E2]	2.53×10^{-4}	$\alpha(K)=0.0001761$ *25*; $\alpha(L)=1.83\times10^{-5}$ *3*; $\alpha(M)=2.84\times10^{-6}$ *4* $\alpha(N)=2.43\times10^{-7}$ *4*; $\alpha(IPF)=5.57\times10^{-5}$ *8* B(E2)(W.u.)=28 *+9−17*
4088.0	$(4^-,5^-)$	1539.6 *3*	100	2550.28	(4^+)			
4094.3	(5^-)	1544.0 *2*	100	2550.28	(4^+)			
4231.8		1087.0‡ *7*	100‡	3144.8	6^+			
4244.98	(1^-)	2513.3‡ *2*	87‡ *5*	1731.51	2^+			
		2835.0‡ *3*	100‡ *6*	1410.22	0^+			
4391.3	2^+	2981.0 *3*	100	1410.22	0^+	[E2]	8.21×10^{-4}	$\alpha(K)=4.48\times10^{-5}$ *7*; $\alpha(L)=4.60\times10^{-6}$ *7*; $\alpha(M)=7.15\times10^{-7}$ *10* $\alpha(N)=6.14\times10^{-8}$ *9*; $\alpha(IPF)=0.000771$ *11* B(E2)(W.u.)=0.87 *21*
4983.3	(9^+)	1465.4‡ *8*	100‡	3517.8	8^+			
5046.3		1252‡& *1*	‡	3794.9	(7^-)			
5192.0		960.2‡ *5*	100‡	4231.8				
5457.0	(10^+)	473.7‡ *5*	100‡	4983.3	(9^+)			
		1939.3‡ *8*	7‡ *3*	3517.8	8^+	[E2]	3.86×10^{-4}	$\alpha(K)=9.47\times10^{-5}$ *14*; $\alpha(L)=9.77\times10^{-6}$ *14*; $\alpha(M)=1.519\times10^{-6}$ *22* $\alpha(N)=1.301\times10^{-7}$ *19*; $\alpha(IPF)=0.000280$ *4* B(E2)(W.u.)>0.061
5687.0	(11)	230.0‡ *3*	100‡	5457.0	(10^+)			
6128.9	(12)	441.9‡ *5*	100‡	5687.0	(11)			

† From (n,n′γ), unless given otherwise.
‡ From (HI,xnγ).
# From ^{82}As β^- Decay (19.1 s).
@ Additional information 1.
& Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

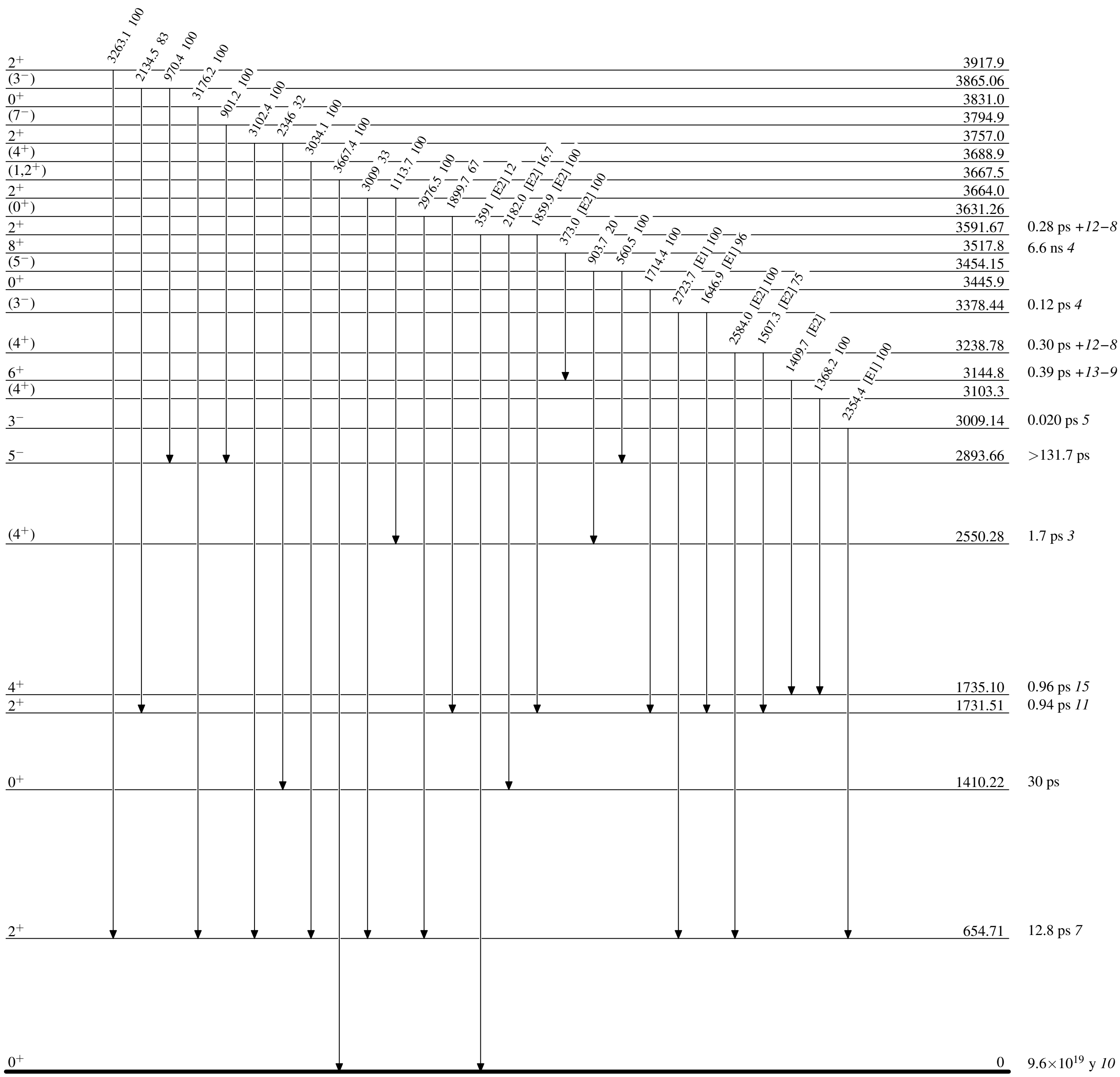
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intentities: Relative photon branching from each level

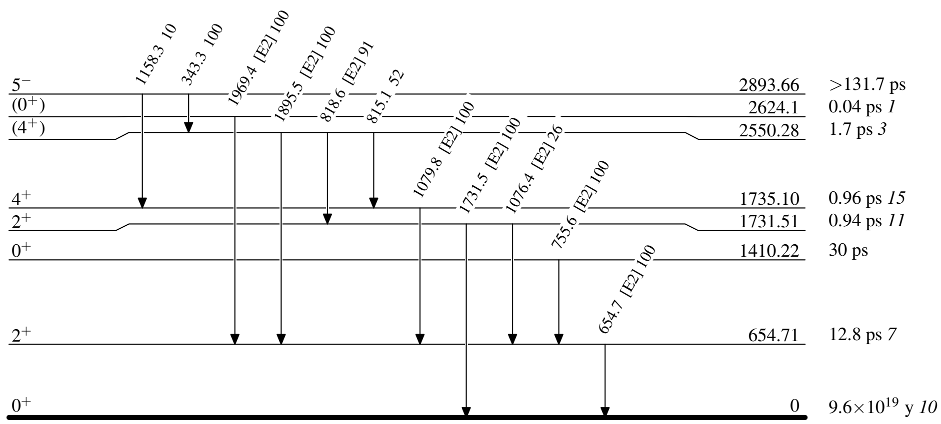


$^{82}_{34}Se_{48}$

Adopted Levels, Gammas

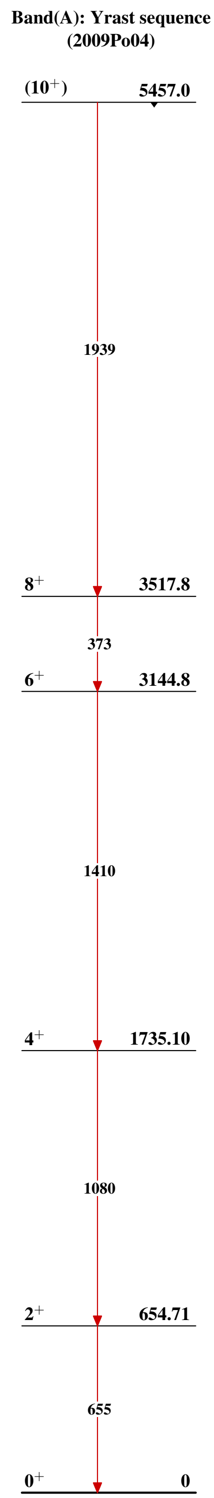
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{82}_{34}Se_{48}$

Adopted Levels, Gammas



$^{82}_{34}Se_{48}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni, M. Fadil, and B. Pfeiffer	NDS 110,2815 (2009)	30-Sep-2009

Q(β^-)=1835 *26*; S(n)=8678 *4*; S(p)=13567 *3*; Q(α)=−8837.3 *28* 2012Wa38
S(2n)=14496.4 *24*, S(2p)=25110.6 *30* (2012Wa38).
Additional information 1.
^{84}Se evaluated by A.A. Sonzogni, M. Fadil, and B. Pfeiffer .
Precise atomic mass measurement: 2008Ha23 (Penning-trap system). Other: 2006Ha62.
A 1360 γ has been assigned feeding the 2121 level in ^{252}Cf SF decay, while a 1361.4γ in ^{208}Pb(^{16}O,Fγ) (2004Pr10) and a 1361.5γ in ^{238}U(p,Fγ) (2013DrZY) has been placed feeding the 3537 level from a 4898 level. Evaluator treats the placement in ^{252}Cf SF decay as uncertain.

^{84}Se Levels

Cross Reference (XREF) Flags

A	^{84}As β^- decay (4.02 s)	E	Coulomb excitation	I	^{238}U(P,Fγ):prompt γ
B	^{85}As β^-n decay (2.021 s)	F	^{192}Os(^{82}Se,Xγ)	J	^{238}U(^{82}Se,^{84}Seγ)
C	^{252}Cf SF decay	G	^{9}Be,^{197}Au(^{84}Se,^{84}Se$'\gamma$)		
D	^{82}Se(t,p)	H	^{208}Pb(^{18}O,Xγ)		

E(level)[‡]	J$^\pi$[†]	T$_{1/2}$	XREF	Comments
0.0[@]	0$^+$	3.26 min *10*	ABCDEFGHIJ	%β^-=100 T$_{1/2}$: weighted average of 3.1 min *1* (1974KrZG), 3.1 min *2* (1975Hu02), 3.5 min *1* (1970Ei02), 3.1 min *2* (1968Re12), and 3.3 min *3* (1960Sa05).
1454.55[@] *8*	2$^+$	0.42 ps *7*	ABCDEFGHIJ	B(E2)↑=0.105 *15* (2010Ga14) B(E2) from ^{197}Au(^{84}Se,^{84}Seγ); deduced T$_{1/2}$ $_{1/2}$=0.42 ps *7*.
1967 *3*	(0$^+$)		D	
2097 *11*	(1$^-$)		D	
2121.65[@] *10*	4$^+$	20.2 ps *+41−26*	ABC EFGHIJ	J$^\pi$: E2 γ to 2$^+$; systematics of N=50 nuclei. T$_{1/2}$: From RDDS, plunger method (2015Li42).
2244 *7*	0$^+$		D	
2461.38 *9*	(1,2$^+$)		A	J$^\pi$: γ rays to 0$^+$ and (2$^+$).
2654 *4*	0$^+$		D	
2699.47 *12*	(2,3,4)		AB	J$^\pi$: γ's to (2$^+$) and (4$^+$).
2716 *10*	(0$^+$)		D	
2740 *11*	(0$^+$)		D	
2984.75 *13*	2$^+$		A D J	
3024.30 *12*	(2$^+$)		A D	
3069.77 *22*			A	
3125.97 *15*			A	
3232.43 *14*			A	
3297.05 *12*			AB	
3370.54 *16*	(6$^+$)	8.2 ps *+17−39*	A C F HIJ	J$^\pi$: γ to 4$^+$; shell-model prediction (2013DrZY). T$_{1/2}$: From RDDS, plunger method (2015Li42).
3408.73 *14*			A J	XREF: J(?).
3439.15 *13*			A J	
3481.7? *10*			C	E(level): assuming 1360 γ feeds the 2121.6 level. See comment on top.
3537.09 *18*	(5$^+$)		C F HIJ	J$^\pi$: level fed from (6$^+$) and γ to (4$^+$), supported by shell model calculations.
3541.23 *10*	2$^+$		A d G	J$^\pi$: L(t,p)=2 for E(level)=3544 *6*.
3548.3 *3*			A d	J$^\pi$: L(t,p)=2 for E(level)=3544 *6*.
3698 *6*			D	

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Adopted Levels, Gammas (continued)

^{84}Se Levels (continued)

E(level)‡	Jπ†	XREF	Comments
3701.47& 19	(6+)	C F HIJ	Jπ: Q γ to (4+) and D γ to (5+), supported by shell model calculations.
3862.5 10		F	
3872.01 14		A	
3928 9	2+	D G	XREF: D(3934). E(level): assumed that 3934 8 in (t,p) is the same as 3916 11 in (^{84}Se,^{84}Se′γ); listed level energy is the weighted average of the two.
3985.27 22	2+	A D	
4082.18 22		A	
4106 17	0+	D	
4116.33 17		A	
4226 4	2+	D	
4282.12 11		A	
4307 7	(2+)	D	
4405.8#& 3	(7+)	C F HI	Jπ: γ to (6+).
4445.19# 22	(4+)	A D	
4602 6	2+	D	
4641.0		IJ	XREF: J(?).
4670 9	(2+)	D	
4723 6		D	
4813 5	(2+)	D	
4898.5 4	(6+)	HI	E(level): assuming 1361 γ feeds the 3537 level. See comment on top. Jπ: shell-model prediction (2013DrZY).
4903 7	(2+,0+)	D	
4981 9	1−	D	
5139 6	2+	D	
5161.17 18		A	
5185 6	2+	D	
5221.96 16		A	
5258 6	4+	D	
5295 9	2+	D	
5329.9&	(8+)	I	
5373 9		D	
5437# 9	(5−)	D	
5507 9	2+	D	
5596.16 20	3−	A D	
5627 9	2+	D	
5637.6 3		A	
5661.53 23		A	
5725 14		D	
5815 12	2+	D	
5869.34 23		A	
5890.1 3	(3−,1−)	A D	
5922# 9	(4+)	D	
6005# 12	(4+)	D	
6019.90 19		A	
6249.60 21		A	
6329 21	2+	D	
6400.4 3	4+	A D	
6414.4&	(9,10)	I	
6541.5 3		A	
6604.6 3		A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{84}Se Levels (continued)

† From L-values observed in ^{82}Se(t,p) (1988Mu02), unless otherwise stated.
‡ Levels connected by γ rays are from least-squares fit to Eγ; others are from ^{82}Se(t,p).
# L(t,p) has possible admixture of L=0 indicating possibility for a doublet.
@ Band(A): Ground state sequence.
& Band(B): Sequence based on (6$^+$).

γ(^{84}Se)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	Comments
1454.55	2$^+$	1454.66 *10*	100	0.0	0$^+$	E2	B(E2)(W.u.)=9.6 *14* E$_\gamma$: weighted average of 1454.55 *10* (^{84}As β^- decay), 1455.1 *2* (^{85}As β^-n decay), 1454.5 *2* (^{208}Pb(^{18}O,Xγ)), 1454.7 *1* (^{192}Os(^{82}Se,Xγ)). Other: Eγ=1455.1 (^{252}Cf SF decay). Mult.: from ^{208}Pb(^{18}O,Xγ).
2121.65	4$^+$	666.99 *7*	100	1454.55	2$^+$	E2	B(E2)(W.u.)=10.0 +*16*−*17* E$_\gamma$: weighted average of 666.97 *10* (^{84}As β^- decay), 667.1 *2* (^{85}As β^-n decay), 666.8 *3* (^{208}Pb(^{18}O,Xγ)), 667.0 *1* (^{192}Os(^{82}Se,Xγ)). Other: Eγ=667.1 (^{252}Cf SF decay). Mult.: from ^{208}Pb(^{18}O,Xγ).
2461.38	(1,2$^+$)	1007.12 *10*	41.9 *17*	1454.55	2$^+$		
		2461.35 *15*	100 *5*	0.0	0$^+$		
2699.47	(2,3,4)	577.77 *14*	100 *3*	2121.65	4$^+$		E$_\gamma$: weighted average of 577.84 *10* (^{84}As β^- decay), 577.5 *2* (^{85}As β^-n decay). I$_\gamma$: weighted average of 100 *3* (^{84}As β^- decay), 100 *15* (^{85}As β^-n decay).
		1245.0 *4*	82 *6*	1454.55	2$^+$		E$_\gamma$: weighted average of 1245.3 *2* (^{84}As β^- decay), 1244.6 *2* (^{85}As β^-n decay). I$_\gamma$: weighted average of 85 *5* (^{84}As β^- decay), 67 *12* (^{85}As β^-n decay).
2984.75	2$^+$	522.2	9.5	2461.38	(1,2$^+$)		
		1530.19 *10*	100 *5*	1454.55	2$^+$		
3024.30	(2$^+$)	325.03 *10*	5.3 *16*	2699.47	(2,3,4)		
		1569.53 *10*	100 *3*	1454.55	2$^+$		
3069.77		1615.2 *2*	100	1454.55	2$^+$		
3125.97		426.4 *2*	29 *15*	2699.47	(2,3,4)		
		1671.45 *15*	100 *8*	1454.55	2$^+$		
3232.43		1110.77 *10*	100	2121.65	4$^+$		
3297.05		1175.9 *2*	9.8 *8*	2121.65	4$^+$		E$_\gamma$,I$_\gamma$: observed only in ^{84}As β^- decay.
		1843.24 *24*	100 *3*	1454.55	2$^+$		E$_\gamma$: weighted average of 1843.13 *10* (^{84}As β^- decay), 1843.7 *2* (^{85}As β^-n decay). I$_\gamma$: from ^{84}As β^- decay.
3370.54	(6$^+$)	1248.88 *13*	100	2121.65	4$^+$	[E2]	B(E2)(W.u.)=1.1 +*8*−*2* E$_\gamma$: weighted average of 1249.0 *2* (^{84}As β^- decay), 1248.7 *2* (^{208}Pb(^{18}O,Xγ)), 1249.0 *3* (^{192}Os(^{82}Se,Xγ)). Other: Eγ=1249.6 (^{252}Cf SF decay).
3408.73		1287.06 *10*	100	2121.65	4$^+$		
3439.15		1317.45 *10*	100 *5*	2121.65	4$^+$		
		1984.7 *2*	23.6 *14*	1454.55	2$^+$		
3481.7?		1360	100	2121.65	4$^+$		
3537.09	(5$^+$)	1415.30 *17*	100	2121.65	4$^+$		E$_\gamma$: weighted average of 1415.3 *2* (^{208}Pb(^{18}O,Xγ)),

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Adopted Levels, Gammas (continued)

$\gamma(^{84}Se)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	Comments
							1415.3 *3* ($^{192}Os(^{82}Se,X\gamma)$). Other: $E\gamma$=1415 (^{252}Cf SF decay).
3541.23	2+	1080.15 *10*	15.8 *7*	2461.38	(1,2+)		
		2086.69 *10*	100 *4*	1454.55	2+		
3548.3		1426.6 *3*	100	2121.65	4+		
3701.47	(6+)	164.18 *21*	41 *8*	3537.09	(5+)	D	E_γ: weighted average of 164.1 *2* ($^{208}Pb(^{18}O,X\gamma)$), 164.7 *5* ($^{192}Os(^{82}Se,X\gamma)$). Other: $E\gamma$=165 (^{252}Cf SF decay). I_γ: weighted average of 80 *40* ($^{208}Pb(^{18}O,X\gamma)$), 39 *8* ($^{192}Os(^{82}Se,X\gamma)$). Mult.: from $\gamma(\theta)$ in $^{192}Os(^{82}Se,X\gamma)$.
		1580.00 *21*	100 *15*	2121.65	4+	Q	E_γ: weighted average of 1579.8 *3* ($^{208}Pb(^{18}O,X\gamma)$), 1580.2 *3* ($^{192}Os(^{82}Se,X\gamma)$). Other: $E\gamma$=1580 (^{252}Cf SF decay). I_γ: weighted average of 100 *21* ($^{208}Pb(^{18}O,X\gamma)$), 100 *22* ($^{192}Os(^{82}Se,X\gamma)$). Mult.: from $\gamma(\theta)$ in $^{192}Os(^{82}Se,X\gamma)$.
3862.5		492.0‡	100	3370.54	(6+)		
3872.01		573.9	21.4	3297.05			
		1750.35 *10*	100 *4*	2121.65	4+		
3928	2+	2462 *11*	100	1454.55	2+		
3985.27	2+	1863.6 *2*	100	2121.65	4+		
4082.18		1960.5 *2*	100	2121.65	4+		
4116.33		574.9	77	3541.23	2+		
		2661.74 *15*	100 *5*	1454.55	2+		
4282.12		741.23 *10*	100 *9*	3541.23	2+		
		985.20 *10*	61.3 *21*	3297.05			
		2159.0 *2*	31.7 *21*	2121.65	4+		
		4280.9 *3*	27.9 *17*	0.0	0+		
4405.8	(7+)	704.34 *24*	100	3701.47	(6+)		E_γ: weighted average of 704.4 *4* ($^{208}Pb(^{18}O,X\gamma)$), 704.3 *3* ($^{192}Os(^{82}Se,X\gamma)$). Other: $E\gamma$=703.5 (^{252}Cf SF decay).
4445.19	(4+)	2323.5 *2*	100	2121.65	4+		
4641.0		1270.0		3370.54	(6+)		
4898.5	(6+)	1361.4 *4*	100	3537.09	(5+)		
5161.17		3039.46 *15*	100	2121.65	4+		
5221.96		1925.5 *2*	73 *5*	3297.05			
		2522.10 *15*	100 *5*	2699.47	(2,3,4)		
5329.9	(8+)	924.4		4405.8	(7+)		
5596.16	3−	2299.0 *2*	90 *7*	3297.05			
		3474.6 *3*	100 *7*	2121.65	4+		
5637.6		4182.9 *3*	100	1454.55	2+		
5661.53		2962.0 *2*	100	2699.47	(2,3,4)		
5869.34		3169.4 *3*	100 *6*	2699.47	(2,3,4)		
		3748.0 *3*	94 *6*	2121.65	4+		
5890.1	(3−,1−)	4435.4 *3*	100	1454.55	2+		
6019.90		2722.80 *15*	100	3297.05			
6249.60		2840.8 *2*	53 *13*	3408.73			
		4127.9 *3*	100 *7*	2121.65	4+		
6400.4	4+	4945.7 *3*	100	1454.55	2+		
6414.4	(9,10)	1084.5		5329.9	(8+)		
6541.5		5086.8 *3*	100	1454.55	2+		
6604.6		5149.9 *3*	100	1454.55	2+		

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Adopted Levels, Gammas (continued)

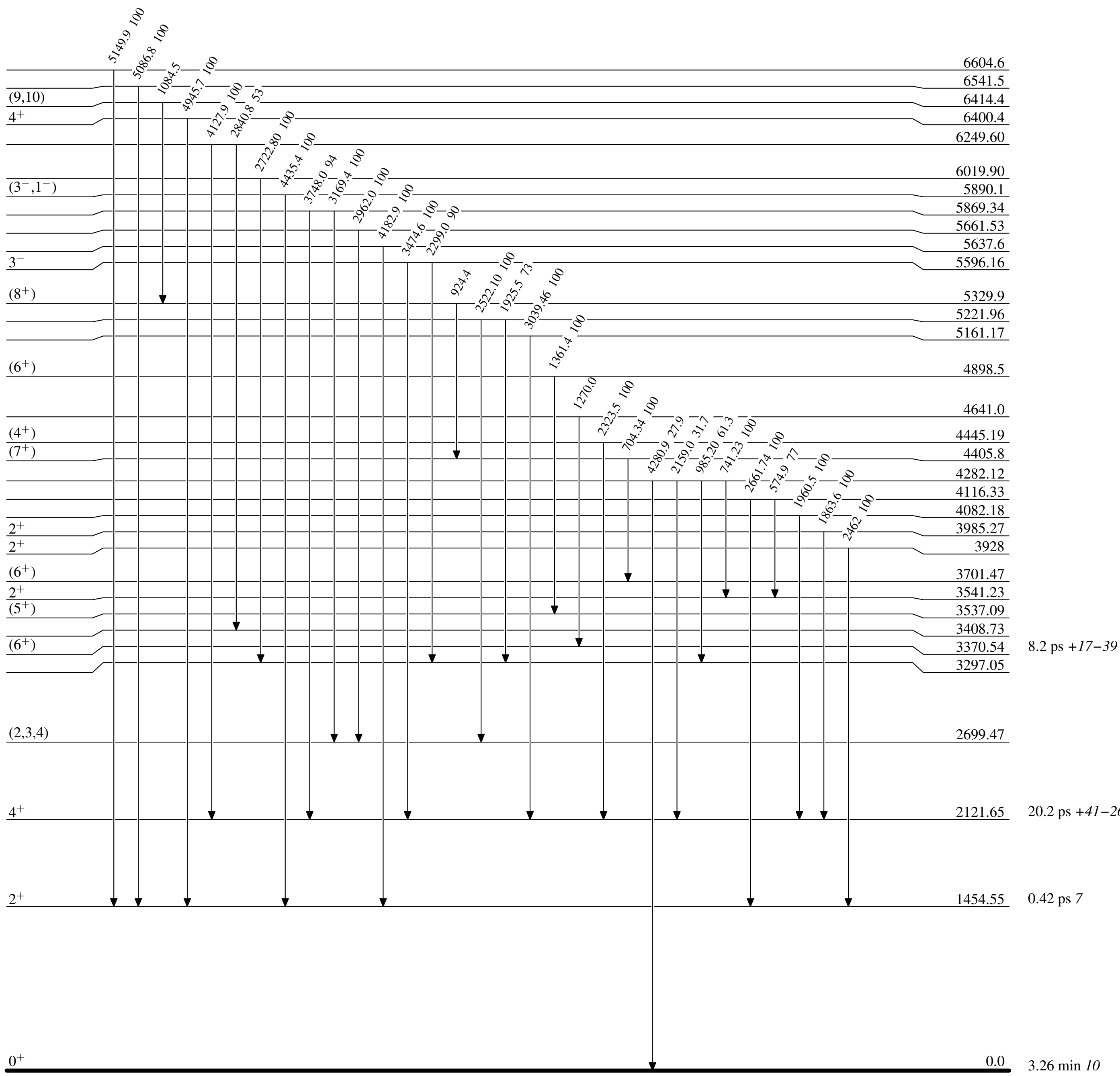
$\gamma(^{84}Se)$ (continued)

† From the corresponding dataset when only one XREF is available. Otherwise, see individual comments for the source.
‡ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

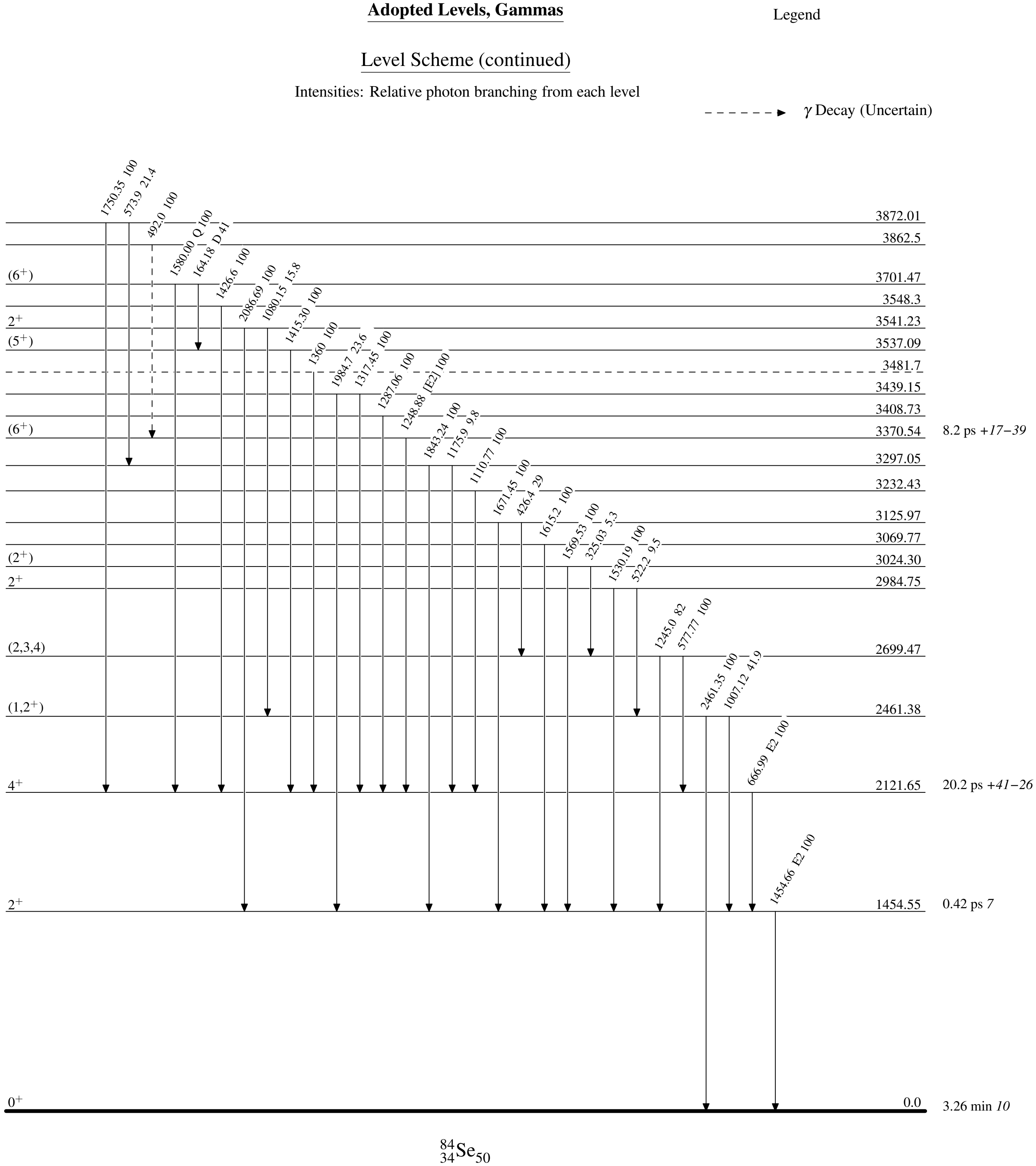


$^{84}_{34}Se_{50}$

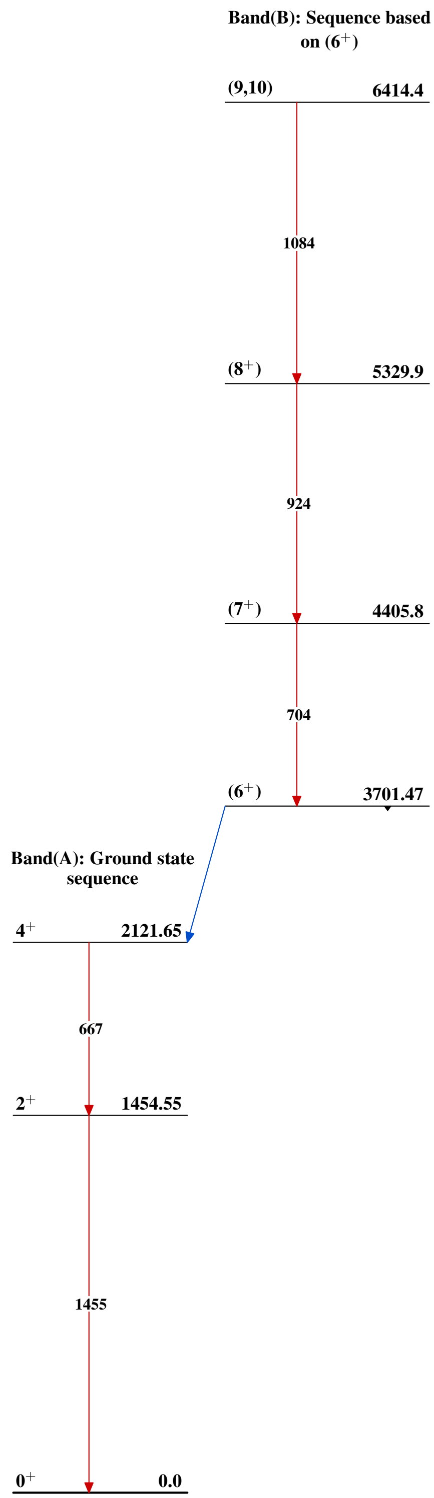
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



Adopted Levels, Gammas



$^{84}_{34}Se_{50}$