Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 132, 1 (2016)	4-Dec-2015

Q(β^-)=−6981 *14*; S(n)=8227 *14*; S(p)=3876 *18*; Q(α)=4622 *6* 2017Wa10
Q(ε)=5.29×10^3 *3*; S(2n)=19062 *14*; S(2p)=5791 *18*; Q(εp)=3.50×10^3 *3* 2017Wa10
Additional information 1.
Data for all of the excited levels are from ^{144}Sm(^{16}O,3nγ).
The unplaced γ's from the ^{157}Lu ε decay are not repeated here, see that decay.

^{157}Yb Levels

E(level)‡	Jπ†	$T_{1/2}$	Comments
0.0&	7/2$^-$	38.6 s *10*	%ε+%β^+=99.5; %α=0.5 μ=−0.639 *8* Jπ: from laser spectroscopy (1991Sc33) and expected configuration of $f_{7/2}$. $T_{1/2}$: from α decay (1977Ha48); other: 34 s *3* from α decay (1970To16). %α: Estimated (1977Ha48 and 1979Ho10) from calculated half-life for α decay and measured half-life. μ: From 2011StZZ compilation and based on data of 1991Sc33 and 1992Ku21 (same authors) by laser spectroscopy. $\Delta\langle r^2\rangle$(157-168)=1.09 fm^2 *4* and $\Delta\langle r^2\rangle$(157-159)=0.24 fm^2 *4* from 1991Sc33 (and 1992Ku21). RMS charge radius $\langle r^2\rangle^{1/2}$=5.1324 fm *100* (2013An02).
205.50@ *10*	(9/2$^-$)		
494.40& *10*	11/2$^-$		Jπ: from stretched E2 based on DCO of γ to 7/2$^-$ g.s.
528.8a *3*	13/2$^+$	45 ns	μ= −0.75 *8* Jπ: From consideration of $\gamma(\theta)$, $T_{1/2}$ and g-factor. Assigned configuration (1984Ra11) is primarily $i_{13/2}$ plus about 13% $f_{7/2}$ coupled to 3$^-$ core excitation. $T_{1/2}$: quoted in 1984Ra11 as from the then unpublished work of C. Baktash et al. μ: From 1989Ra17 evaluation and 2011StZZ compilation and based on g-factor=−0.116 *12* (1984Ra11).
721.60@ *14*	(13/2$^-$)		
1019.6a *3*	17/2$^+$		
1063.80& *14*	15/2$^-$		
1328.80@ *18*	(17/2$^-$)		
1563.3a *3*	21/2$^+$		
1652.5 *4*			
1679.20& *17*	19/2$^-$		
1998.5@ *4*	(21/2$^-$)		
2149.9a *3*	25/2$^+$		
2192.7b *4*	23/2$^{(+)}$		
2333.6& *3*	23/2$^-$		
2526.8# *4*	(23/2$^-$)		
2579.9b *4*	27/2$^{(+)}$		
2742.3@ *5*	(25/2$^-$)		
2822.6a *4*	29/2$^+$		
2879.3 *6*			
2901.1& *4*	27/2$^-$		
2968.5# *4*	(27/2$^-$)		
3372.3b *4*	31/2$^{(+)}$		
3390.7@ *7*	(29/2$^-$)		

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Adopted Levels, Gammas (continued)

^{157}Yb Levels (continued)

E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†
3441.5[&] 5	31/2−	4182.6[a] 4	37/2+	5142.9[c] 6	(41/2−)	6359.5[c] 6	(49/2−)
3501.3[a] 4	33/2+	4447.5[c] 5	(37/2−)	5198.4 6		6986.8[a] 6	53/2+
3661.9[#] 7		4703.9[b] 4	39/2(+)	5491.8[a] 5	45/2+	7185.1[c] 8	(53/2−)
3690.1[c] 5	(33/2−)	4799.6[&] 8	(39/2−)	5662.8 5		7907.5[c] 10	(57/2−)
3983.1[@] 9	(33/2−)	4840.0 6		5742.3[c] 6	(45/2−)		
4071.2[b] 4	35/2(+)	4867.7[a] 4	41/2+	5970.9 7			
4086.0[&] 6	35/2−	5119.0[b] 4	43/2(+)	6253.7[a] 6	49/2+		

† Above the 13/2+ level assignments are from level sequences and DCO's (2013Xu05).
‡ From least-squares fit to Eγ values.
# Band(A): γ cascade.
@ Band(B): νh$_{9/2}$ band.
& Band(C): νf$_{7/2}$, g.s. band.
a Band(D): νi$_{13/2}$ band.
b Band(E): γ cascade based on 23/2+.
c Band(F): γ cascade based on (33/2−).

γ(^{157}Yb)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	α#	Comments
205.50	(9/2−)	205.5 *1*	100	0.0	7/2−	(M1+E2)	0.344 *99*	α(K)=0.26 *11*; α(L)=0.064 *8*; α(M)=0.0148 *24* α(N)=0.0034 *5*; α(O)=0.00045 *3*; α(P)=1.48×10^{-5} *77*
494.40	11/2−	288.9 *5*	2.6 *3*	205.50	(9/2−)	(M1+E2)	0.129 *46*	α(K)=0.102 *44*; α(L)=0.0203 *17*; α(M)=0.00468 *24* α(N)=0.00109 *7*; α(O)=0.000147 *19*; α(P)=5.9×10^{-6} *30*
		494.4 *1*	100 *1*	0.0	7/2−	Q		
528.8	13/2+	(34.4)		494.40	11/2−			Eγ: from level-energy difference.
		323.3 *3*	100	205.50	(9/2−)			
721.60	(13/2−)	516.1 *1*	100	205.50	(9/2−)	E2	0.01646	α(K)=0.01300 *19*; α(L)=0.00268 *4*; α(M)=0.000619 *9* α(N)=0.0001438 *21*; α(O)=1.91×10^{-5} *3*; α(P)=7.15×10^{-7} *10*
1019.6	17/2+	490.8 *1*	100	528.8	13/2+	E2	0.0187	α(K)=0.01467 *21*; α(L)=0.00312 *5*; α(M)=0.000722 *11* α(N)=0.0001675 *24*; α(O)=2.22×10^{-5} *4*; α(P)=8.03×10^{-7} *12*
1063.80	15/2−	569.4 *1*	100	494.40	11/2−	E2	0.01291	α(K)=0.01031 *15*; α(L)=0.00202 *3*; α(M)=0.000463 *7* α(N)=0.0001077 *15*; α(O)=1.447×10^{-5} *21*; α(P)=5.71×10^{-7} *8*
1328.80	(17/2−)	607.2 *1*	100	721.60	(13/2−)	E2	0.01107	α(K)=0.00890 *13*; α(L)=0.001683 *24*; α(M)=0.000386 *6* α(N)=8.97×10^{-5} *13*; α(O)=1.213×10^{-5} *17*; α(P)=4.95×10^{-7} *7*
1563.3	21/2+	543.7 *1*	100	1019.6	17/2+	E2	0.01446	α(K)=0.01149 *16*; α(L)=0.00230 *4*;

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Yb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(M)=0.000530 *8* α(N)=0.0001232 *18*; α(O)=1.648×10^{-5} *23*; α(P)=6.34×10^{-7} *9*
1652.5		632.9 *3*	100	1019.6	17/2$^+$			
1679.20	19/2$^-$	615.4 *1*	100	1063.80	15/2$^-$	E2	0.01072	α(K)=0.00863 *12*; α(L)=0.001622 *23*; α(M)=0.000371 *6* α(N)=8.65×10^{-5} *13*; α(O)=1.170×10^{-5} *17*; α(P)=4.80×10^{-7} *7*
1998.5	(21/2$^-$)	669.7 *3*	100	1328.80	(17/2$^-$)	E2	0.00881	α(K)=0.00714 *10*; α(L)=0.001292 *19*; α(M)=0.000295 *5* α(N)=6.86×10^{-5} *10*; α(O)=9.35×10^{-6} *14*; α(P)=3.99×10^{-7} *6*
2149.9	25/2$^+$	586.6 *1*	100	1563.3	21/2$^+$	E2	0.01202	α(K)=0.00963 *14*; α(L)=0.00185 *3*; α(M)=0.000425 *6* α(N)=9.89×10^{-5} *14*; α(O)=1.333×10^{-5} *19*; α(P)=5.34×10^{-7} *8*
2192.7	23/2$^{(+)}$	540.2 *5*	28 *8*	1652.5				
		629.4 *3*	100 *2*	1563.3	21/2$^+$			
2333.6	23/2$^-$	654.4 *3*	100	1679.20	19/2$^-$	E2	0.00929	α(K)=0.00752 *11*; α(L)=0.001373 *20*; α(M)=0.000314 *5* α(N)=7.30×10^{-5} *11*; α(O)=9.93×10^{-6} *14*; α(P)=4.19×10^{-7} *6*
2526.8	(23/2$^-$)	963.5 *3*	100	1563.3	21/2$^+$	D		
2579.9	27/2$^{(+)}$	387.2 *3*	72 *2*	2192.7	23/2$^{(+)}$	E2	0.0352	α(K)=0.0266 *4*; α(L)=0.00665 *10*; α(M)=0.001557 *23* α(N)=0.000360 *6*; α(O)=4.66×10^{-5} *7*; α(P)=1.419×10^{-6} *20*
		430.0 *1*	100 *3*	2149.9	25/2$^+$			
2742.3	(25/2$^-$)	743.8 *3*	100	1998.5	(21/2$^-$)	E2	0.00695	α(K)=0.00568 *8*; α(L)=0.000985 *14*; α(M)=0.000224 *4* α(N)=5.22×10^{-5} *8*; α(O)=7.16×10^{-6} *10*; α(P)=3.18×10^{-7} *5*
2822.6	29/2$^+$	672.7 *1*	100	2149.9	25/2$^+$	E2	0.00872	α(K)=0.00707 *10*; α(L)=0.001276 *18*; α(M)=0.000291 *4* α(N)=6.78×10^{-5} *10*; α(O)=9.25×10^{-6} *13*; α(P)=3.95×10^{-7} *6*
2879.3		729.4 *5*	100	2149.9	25/2$^+$			
2901.1	27/2$^-$	374.3 *5*	33 *3*	2526.8	(23/2$^-$)	E2	0.0388	α(K)=0.0291 *5*; α(L)=0.00745 *11*; α(M)=0.00175 *3* α(N)=0.000405 *6*; α(O)=5.21×10^{-5} *8*; α(P)=1.543×10^{-6} *23*
		567.5 *3*	100 *13*	2333.6	23/2$^-$	E2	0.01302	α(K)=0.01039 *15*; α(L)=0.00203 *3*; α(M)=0.000468 *7* α(N)=0.0001087 *16*; α(O)=1.461×10^{-5} *21*; α(P)=5.75×10^{-7} *8*
		751.2 *5*	22 *2*	2149.9	25/2$^+$			
2968.5	(27/2$^-$)	441.7 *5*	21 *5*	2526.8	(23/2$^-$)			
		818.6 *3*	100 *2*	2149.9	25/2$^+$	D		
3372.3	31/2$^{(+)}$	549.7 *3*	17 *1*	2822.6	29/2$^+$			
		792.4 *1*	100 *2*	2579.9	27/2$^{(+)}$	E2	0.00605	α(K)=0.00497 *7*; α(L)=0.000841 *12*; α(M)=0.000191 *3* α(N)=4.45×10^{-5} *7*; α(O)=6.13×10^{-6} *9*; α(P)=2.79×10^{-7} *4*
3390.7	(29/2$^-$)	648.4 *5*	100	2742.3	(25/2$^-$)	E2	0.00949	α(K)=0.00767 *11*; α(L)=0.001408 *20*;

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Yb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(M)=0.000322 *5* α(N)=7.49×10^{-5} *11*; α(O)=1.018×10^{-5} *15*; α(P)=4.28×10^{-7} *6*
3441.5	31/2$^-$	540.4 *3*	100	2901.1	27/2$^-$	E2	0.01468	α(K)=0.01165 *17*; α(L)=0.00234 *4*; α(M)=0.000540 *8* α(N)=0.0001254 *18*; α(O)=1.677×10^{-5} *24*; α(P)=6.43×10^{-7} *9*
3501.3	33/2$^+$	678.7 *1*	100	2822.6	29/2$^+$	E2	0.00854	α(K)=0.00693 *10*; α(L)=0.001247 *18*; α(M)=0.000284 *4* α(N)=6.62×10^{-5} *10*; α(O)=9.04×10^{-6} *13*; α(P)=3.87×10^{-7} *6*
3661.9		693.4 *5*	100	2968.5	(27/2$^-$)			
3690.1	(33/2$^-$)	317.8 *3*	100	3372.3	31/2$^{(+)}$	D		
3983.1	(33/2$^-$)	592.4 *5*	100	3390.7	(29/2$^-$)			
4071.2	35/2$^{(+)}$	569.9 *3*	100 *11*	3501.3	33/2$^+$	D		
		698.9 *3*	80 *9*	3372.3	31/2$^{(+)}$	E2	0.00799	α(K)=0.00650 *10*; α(L)=0.001155 *17*; α(M)=0.000263 *4* α(N)=6.13×10^{-5} *9*; α(O)=8.38×10^{-6} *12*; α(P)=3.64×10^{-7} *6*
4086.0	35/2$^-$	644.5 *3*	100	3441.5	31/2$^-$	E2	0.00962	α(K)=0.00778 *11*; α(L)=0.001431 *21*; α(M)=0.000327 *5* α(N)=7.61×10^{-5} *11*; α(O)=1.034×10^{-5} *15*; α(P)=4.34×10^{-7} *6*
4182.6	37/2$^+$	681.3 *1*	100	3501.3	33/2$^+$	E2	0.00847	α(K)=0.00688 *10*; α(L)=0.001234 *18*; α(M)=0.000281 *4* α(N)=6.56×10^{-5} *10*; α(O)=8.95×10^{-6} *13*; α(P)=3.84×10^{-7} *6*
4447.5	(37/2$^-$)	757.4 *3*	100	3690.1	(33/2$^-$)	E2	0.00668	α(K)=0.00547 *8*; α(L)=0.000941 *14*; α(M)=0.000214 *3* α(N)=4.98×10^{-5} *7*; α(O)=6.85×10^{-6} *10*; α(P)=3.07×10^{-7} *5*
4703.9	39/2$^{(+)}$	521.3 *3*	65 *1*	4182.6	37/2$^+$	D		
		632.7 *3*	100 *1*	4071.2	35/2$^{(+)}$	E2	0.01004	α(K)=0.00811 *12*; α(L)=0.001504 *22*; α(M)=0.000344 *5* α(N)=8.01×10^{-5} *12*; α(O)=1.086×10^{-5} *16*; α(P)=4.52×10^{-7} *7*
4799.6	(39/2$^-$)	713.6 *5*	100	4086.0	35/2$^-$			
4840.0		657.4 *5*	100	4182.6	37/2$^+$			
4867.7	41/2$^+$	685.1 *1*	100	4182.6	37/2$^+$	E2	0.00836	α(K)=0.00679 *10*; α(L)=0.001217 *17*; α(M)=0.000277 *4* α(N)=6.46×10^{-5} *9*; α(O)=8.82×10^{-6} *13*; α(P)=3.80×10^{-7} *6*
5119.0	43/2$^{(+)}$	251.3 *5*	9 *1*	4867.7	41/2$^+$			
		415.1 *3*	100 *2*	4703.9	39/2$^{(+)}$	E2	0.0291	α(K)=0.0223 *4*; α(L)=0.00528 *8*; α(M)=0.001233 *18* α(N)=0.000286 *4*; α(O)=3.72×10^{-5} *6*; α(P)=1.198×10^{-6} *17*
5142.9	(41/2$^-$)	695.4 *3*	100	4447.5	(37/2$^-$)	E2	0.00808	α(K)=0.00657 *10*; α(L)=0.001170 *17*; α(M)=0.000266 *4* α(N)=6.21×10^{-5} *9*; α(O)=8.49×10^{-6} *12*; α(P)=3.68×10^{-7} *6*
5198.4		1015.8 *5*	100	4182.6	37/2$^+$			
5491.8	45/2$^+$	372.8 *3*	75 *6*	5119.0	43/2$^{(+)}$			
		624.1 *3*	100 *6*	4867.7	41/2$^+$	E2	0.01037	α(K)=0.00836 *12*; α(L)=0.001561 *22*;

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Adopted Levels, Gammas (continued)

γ(^{157}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(M)=0.000357 *5* α(N)=8.32×10^{-5} *12*; α(O)=1.126×10^{-5} *16*; α(P)=4.65×10^{-7} *7*
5662.8		795.1 *3*	100	4867.7	41/2$^+$			
5742.3	(45/2$^-$)	599.4 *3*	100 *6*	5142.9	(41/2$^-$)	E2	0.01141	α(K)=0.00916 *13*; α(L)=0.001744 *25*; α(M)=0.000400 *6* α(N)=9.31×10^{-5} *13*; α(O)=1.256×10^{-5} *18*; α(P)=5.09×10^{-7} *8*
		623.3 *5*	19 *2*	5119.0	43/2$^{(+)}$			
5970.9		479.1 *5*	100	5491.8	45/2$^+$			
6253.7	49/2$^+$	761.9 *3*	100	5491.8	45/2$^+$	E2	0.00659	α(K)=0.00540 *8*; α(L)=0.000927 *13*; α(M)=0.000210 *3* α(N)=4.91×10^{-5} *7*; α(O)=6.75×10^{-6} *10*; α(P)=3.03×10^{-7} *5*
6359.5	(49/2$^-$)	617.2 *3*	100	5742.3	(45/2$^-$)	E2	0.01065	α(K)=0.00857 *12*; α(L)=0.001609 *23*; α(M)=0.000368 *6* α(N)=8.58×10^{-5} *12*; α(O)=1.161×10^{-5} *17*; α(P)=4.77×10^{-7} *7*
6986.8	53/2$^+$	733.1 *3*	100	6253.7	49/2$^+$	E2	0.00718	α(K)=0.00586 *9*; α(L)=0.001021 *15*; α(M)=0.000232 *4* α(N)=5.41×10^{-5} *8*; α(O)=7.43×10^{-6} *11*; α(P)=3.28×10^{-7} *5*
7185.1	(53/2$^-$)	825.6 *5*	100	6359.5	(49/2$^-$)			
7907.5	(57/2$^-$)	722.4 *5*	100	7185.1	(53/2$^-$)			

[†] For comments on the uncertainties, see ^{144}Sm(^{16}O,3nγ) data set.

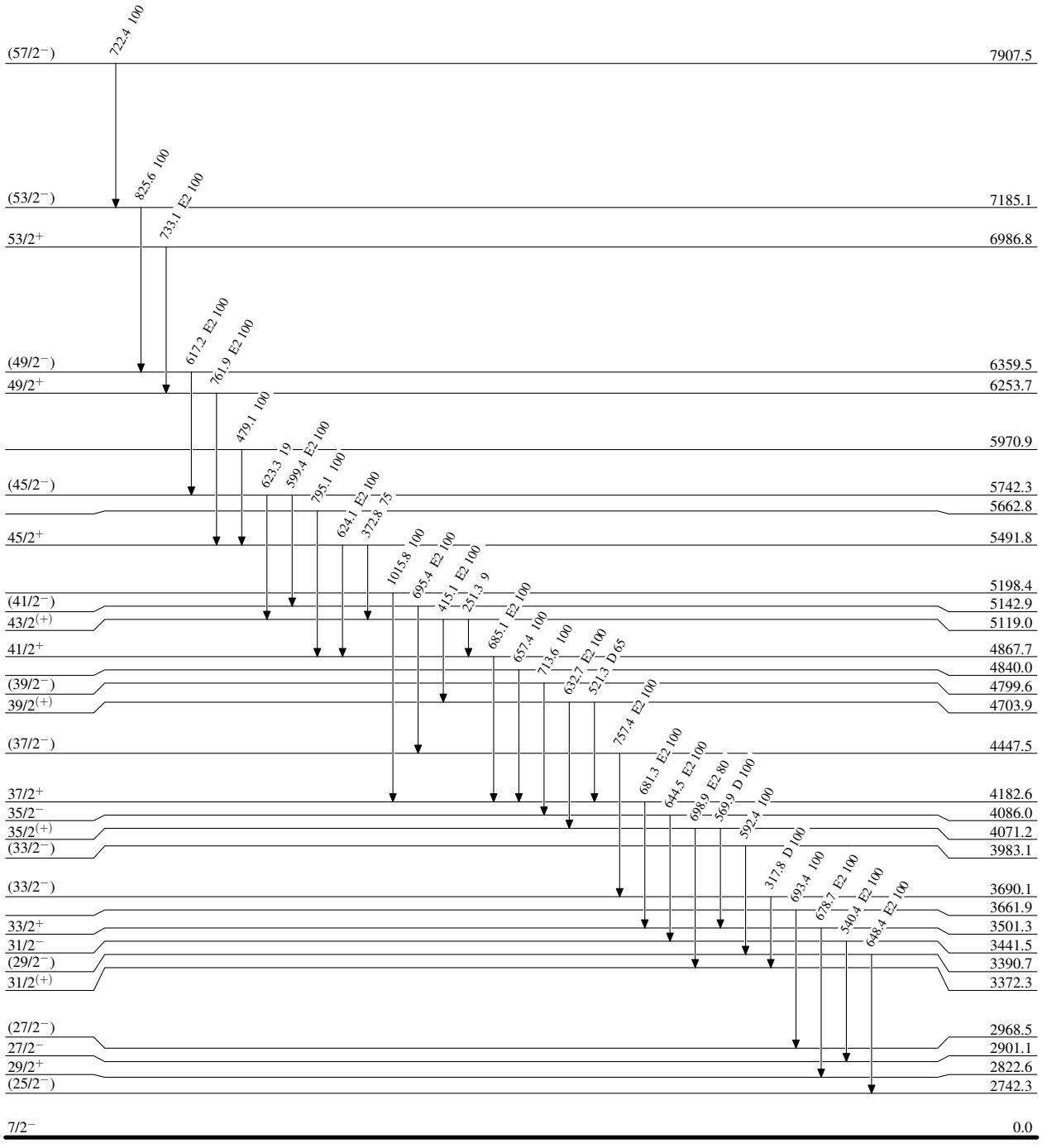
[‡] Authors (2013Xu05) give DCO values, but do not make multipolarity assignments. Expected ratios are >1.0 for ΔJ=2, Q and <0.8 for ΔJ=1, dipole transition, with gates on ΔJ=2, quadrupole transitions. Stretched quadrupole transitions can be interpreted as E2′s.

[#] Additional information 2.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{157}_{70}Yb_{87}$

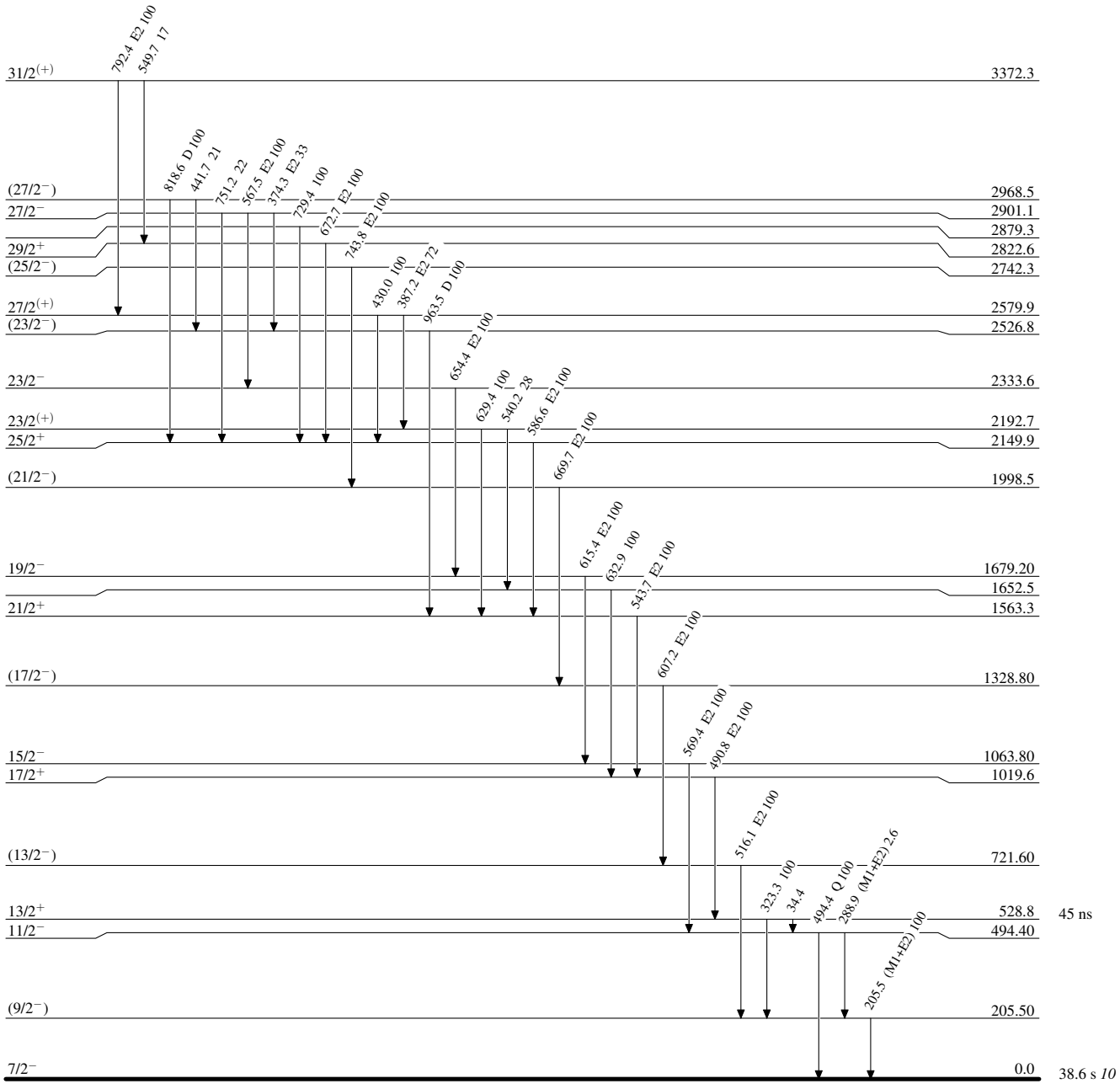
Adopted Levels, Gammas

Legend

Level Scheme (continued)

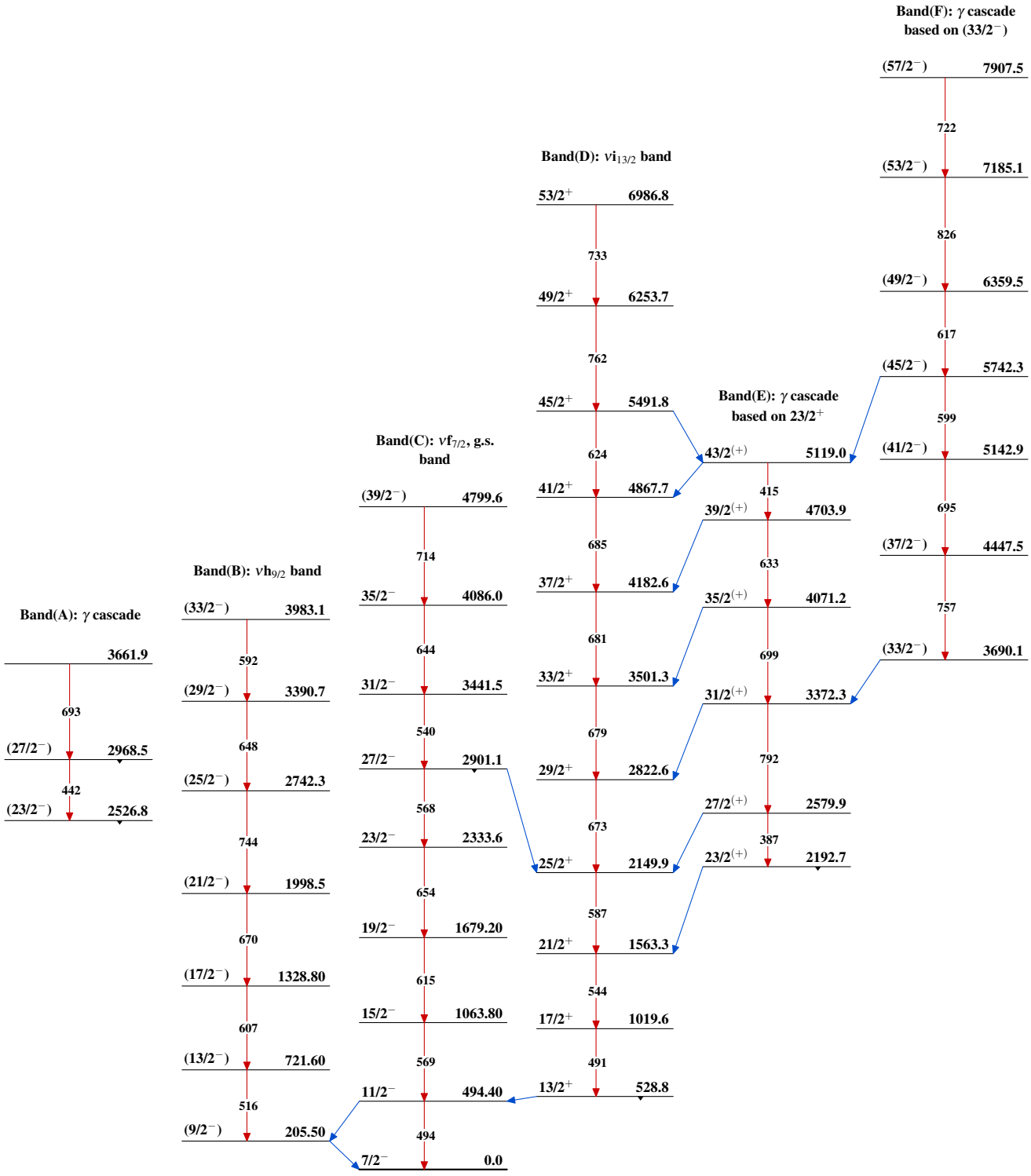
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{157}_{70}Yb_{87}$

Adopted Levels, Gammas



$^{157}_{70}Yb_{87}$