Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

Q(β^-)=−1475 *27*; S(n)=7320 *30*; S(p)=3829 *26*; Q(α)=3100 *50* 2012Wa38
S(2n)=16330 *40*; S(2p)=9820 (syst) *60* (2012Wa38).
α: Additional information 1.

^{180}Re Levels

Most of the Adopted Levels are from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ). The band structures observed in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ) are similar, however, differ in bandhead energy and assigned spin. Configuration assignments are taken from 2005El10.

Cross Reference (XREF) Flags

- A ^{180}Os ε decay
- B ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ)
- C ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	XREF	Comments
0.0[e]	(1)$^-$	2.46 min *3*	A C	%ε+%β^+=100 μ=1.56 *17* J$^\pi$: 20.1γ E1 from 1$^+$; direct feeding to J^π=2$^-$, 1006 level in ^{180}W. μ: Static Nuclear Orientation with gamma detection (1992Bo39). $T_{1/2}$: weighted average of 2.42 min *7* (1955Fi30), 2.45 min *10* (1966Ho16), 2.6 min *2* (1977Ha24), and 2.47 min *3* (2009Fa01). Configuration: π5/2[402]ν7/2[514].
20.10 *10*	1$^+$	88 ns *3*	A	J$^\pi$: directly fed in ^{180}Os ε decay (J^π=0$^+$). $T_{1/2}$: from $\gamma\gamma$(t) in ^{180}Os ε decay. Configuration: π9/2[514]ν7/2[514].
49.9[e] *7*	(2)$^-$		A	J$^\pi$: 49.8γ M1 to (1)$^-$, band assignment.
74.6 *7*	(2)$^+$		A	J$^\pi$: 54.4γ to 1$^+$, band assignment.
218.2 *6*			A	
249.9 *7*			A	
349.2 *6*			A	
401.7 *8*			A	
668.7 *7*			A	
717.1 *7*			A	
0.0+x[@]	(5$^+$)		BC	J$^\pi$: assigned as (4$^-$,5$^-$) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+45.8[&] *5*	(6$^+$)		C	
x+70.6[a] *5*	(7$^+$)		C	
x+123.4[@] *5*	(7$^+$)		C	
x+162.8[a] *6*	(8$^+$)		BC	J$^\pi$: assigned as (6$^-$) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+177.8[b] *6*	(7$^-$)		C	
x+205.2[d] *6*	8$^+$		BC	J$^\pi$: assigned as (6$^-$) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+230.1[&] *5*	(8$^+$)		BC	
x+266.6[c] *6*	(8$^-$)		BC	
x+284.2[e] *6*	9$^-$	75.1 ns *14*	BC	$T_{1/2}$: weighted average of 75.6 ns *14* from $\gamma\gamma$(t) in ^{176}Yb(^{11}B,5nγ) and 73 ns *3* from $\gamma\gamma$(t) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). Other: 78 ns *9* from γ(t) in ^{176}Yb(^{10}B,6nγ). J$^\pi$: assigned as (7$^+$) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}Re Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				Configuration: $\pi 9/2[514]\nu 9/2[624]$.
x+312.3[a] 5	(9^+)		BC	
x+363.2[@] 5	(9^+)		BC	
x+370.9[b] 6	(9^-)		BC	
x+414.1[d] 6	9^+		BC	
x+418.6[e] 6	10^-		BC	
x+495.1[a] 5	(10^+)		BC	
x+523.1[&] 5	(10^+)		BC	
x+526.7[c] 6	(10^-)		BC	
x+595.3[e] 6	11^-		BC	
x+642.5[d] 6	10^+		BC	
x+672.2[b] 6	(11^-)		BC	
x+696.5[@] 5	(11^+)		BC	
x+715.7[a] 5	(11^+)		BC	
x+805.4[e] 6	12^-		BC	
x+888.5[d] 6	11^+		BC	
x+902.3[c] 6	(12^-)		BC	
x+905.5[&] 5	(12^+)		BC	
x+949.4[a] 5	(12^+)		BC	
x+1043.0[e] 6	13^-		BC	
x+1079.4[b] 6	(13^-)		BC	
x+1132.1[@] 5	(13^+)		BC	
x+1150.0[d] 6	12^+		BC	
x+1204.9[a] 5	(13^+)		BC	
x+1304.4[e] 6	14^-		BC	
x+1379.2[&] 6	(14^+)		BC	
x+1386.8[c] 6	(14^-)		BC	
x+1403.0 6	(12^-)		BC	
x+1425.3[d] 6	13^+		BC	
x+1482.3[a] 6	(14^+)		BC	
x+1566.8[f] 6	13^+	73.4 ns *16*	BC	$T_{1/2}$: weighted average of 74.2 ns *14* from $\gamma\gamma$(t) in ^{174}Yb(^{11}B,5nγ) and 70 ns *3* from $\gamma\gamma$(t) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). Other: 67 ns *9* from γ(t) in ^{176}Yb(^{10}B,6nγ). Jπ: assigned as (11^-) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+1586.1[b] 6	(15^-)		BC	
x+1587.5[e] 6	15^-		BC	
x+1643.4[@] 5	(15^+)		BC	
x+1669.8 6	(13^-)		BC	
x+1701.2[g] 6	14^-	<5.6 ns	BC	Jπ: assigned as (10^+) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+1712.0[d] 6	14^+		BC	
x+1755.6[h] 6	15^-	<5.6 ns	C	
x+1768.1[a] 6	(15^+)		BC	
x+1846.9[f] 6	(14^+)		BC	
x+1876.1[i] 6	16^+		BC	Jπ: assigned as (11^-) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+1888.6[e] 6	16^-		BC	
x+1926.5[&] 6	(16^+)		BC	
x+1930.2[g] 6	15^-		BC	
x+1969.0[c] 6	(16^-)		BC	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}Re Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
x+2008.1[d] 6	15^+		BC	
x+2045.7[h] 6	16^-		BC	
x+2075.4[a] 6	(16^+)		BC	
x+2140.0[i] 6	17^+		BC	
x+2148.5[f] 6	(15^+)		BC	
x+2161.5[g] 6	16^-		BC	
x+2186.4[b] 6	(17^-)		BC	
x+2205.6[e] 6	17^-		BC	
x+2222.8[@] 6	(17^+)		BC	
x+2310.0[d] 6	16^+		BC	
x+2356.7[h] 6	17^-		BC	
x+2375.7[a] 6	(17^+)		BC	
x+2416.1[i] 6	18^+		BC	
x+2421.2[g] 6	17^-		BC	
x+2474.3[f] 6	(16^+)		BC	
x+2533.0[e] 6	18^-		BC	
x+2537.2[&] 7	(18^+)		BC	
x+2617.1[d] 6	17^+		BC	
x+2633.1[c] 7	(18^-)		C	
x+2683.8[h] 6	18^-		BC	
x+2693.6[a] 6	(18^+)		C	
x+2707.4[i] 6	19^+		BC	
x+2710.4[g] 6	18^-		BC	
x+2861.0[@] 6	(19^+)		BC	
x+2867.4[b] 6	(19^-)		BC	
x+2872.7[e] 6	19^-		BC	
x+2922.3[d] 6	18^+		BC	
x+3002.7[g] 6	19^-		C	
x+3015.0[i] 6	20^+		BC	
x+3051.9 6	18^+		C	
x+3069.0 6	(18^+)		C	
x+3122.8 6	(18^+)		C	
x+3203.2[&] 7	(20^+)		BC	
x+3209.9[e] 6	20^-		BC	
x+3234.7[d] 6	(19^+)		BC	
x+3327.5[g] 6	20^-		C	
x+3339.4[i] 6	21^+		BC	
x+3353.1?[c] 7	(20^-)		C	
x+3369.6 6	(19^-)		C	
x+3408.5 6	(20^+)		C	
x+3471.8[j] 6	21^-	9.0 μs 7	BC	$T_{1/2}$: from beam pulse-γ(t) in ^{174}Yb(^{11}B,5nγ).
x+3550.1[@] 6	(21^+)		BC	
x+3551.4[e] 6	21^-		BC	
x+3616.0[b] 6	(21^-)		BC	
x+3668.5[g] 6	21^-		BC	
x+3680.5[i] 6	22^+		BC	
x+3851.3[j] 7	22^-		C	
x+3861.9[e] 6	22^-		BC	
x+3895.8[k] 6	(22^+)		C	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}Re Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
x+3911.0[&] 8	(22+)	BC	x+4412.6[i] 6	24+	BC	x+5102.9?[@] 7	(25+)	C
x+4025.7[g] 7	22−	BC	x+4525.6[e] 6	24−	BC	x+5206.2[i] 6	26+	C
x+4038.0[i] 6	23+	C	x+4637.6[j] 7	24−	C	x+5436.1[k] 7	(26+)	C
x+4205.8[e] 6	23−	BC	x+4643.7[&] 9	(24+)	C	x+5455.3[j] 9	(26−)	C
x+4240.9[j] 7	23−	C	x+4651.8[k] 7	(24+)	C	x+5838.3[k] 7	(27+)	C
x+4269.8[k] 7	(23+)	C	x+4802.0[i] 6	25+	BC	x+6249.9[k] 8	(28+)	C
x+4300.2[@] 7	(23+)	C	x+4888.7[e] 6	(25−)	BC	x+6673.6[k] 8	(29+)	C
x+4392.1[g] 7	23−	C	x+5040.5[k] 7	(25+)	C			
x+4412.1?[b] 6	(23−)	C	x+5048.1[j] 9	(25−)	C			

† From a least-squares fit to Eγ, by evaluator.

‡ Spin and parity assignments from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ). The level scheme is constructured around the bands built on the 8+, 205.1+x level and the 9− 284.2+x level. The spins of these levels were established by considering signature splittings, g-factors, systematics, bandhead energies and quasiparticle alignments and comparing to theoretical predictions in 1994Ja19. Within bands, spin and parity assignments are based on rotational structure, γ-ray multipolarities and decay patterns. Assignments of ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ) do not agree with those from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). The former are adopted as many additional linking transitions between bands were identified. Discrepancies in bandhead spin assignments are indicated in the comments.

From γγ(t) in ^{174}Yb(^{11}B,5nγ), except where noted.

@ Band(A): $K^\pi=(4^+)$ band, α =1. Configuration=ν7/2[514]⊗π1/2[541].

& Band(B): $K^\pi=(4^+)$ band, α=0. Configuration=ν7/2[514]⊗π1/2[541].

a Band(C): $K^\pi=(7^+)$ band. Configuration=ν9/2[624]⊗π5/2[402].

b Band(D): $K^\pi=(5^-)$ band, α=1. Configuration=ν9/2[624]⊗π1/2[541].

c Band(E): $K^\pi=(5^-)$ band, α=0. Configuration=ν9/2[624]⊗π1/2[541].

d Band(F): $K^\pi=8^+$ band. Configuration=ν7/2[514]⊗π9/2[514].

e Band(G): $K^\pi=9^-$ band. Configuration=ν9/2[624]⊗π9/2[514].

f Band(H): $K^\pi=13^+$ band. 4qp band with configuration=ν(7/2[514],9/2[624],5/2[512])⊗π(5/2[402]).

g Band(I): $K^\pi=14^-$ band. 4qp band with configuration=ν(7/2[514],9/2[624],7/2[633])⊗π(5/2[402]).

h Band(J): $K^\pi=15^-$ band. 4qp band with configuration=ν(7/2[514],9/2[624],5/2[512])⊗π(9/2[514]).

i Band(K): $K^\pi=16^+$ band. 4qp band with configuration=ν(7/2[514],9/2[624],7/2[633])⊗π(9/2[514]).

j Band(L): $K^\pi=21^-$ band. 6qp band with configuration=ν(7/2[514],9/2[624],5/2[512])⊗π(5/2[402],9/2[514],7/2[404]).

k Band(M): $K^\pi=(22^+)$ band. 6qp band with configuration=ν(7/2[514],9/2[624],7/2[633])⊗π(5/2[402],9/2[514],7/2[404]).

Adopted Levels, Gammas (continued)

γ(^{180}Re)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
20.10	1^+	20.1[#] *1*	100	0.0	$(1)^-$	E1[@]		5.80 *12*	α(L)=4.45 *9*; α(M)=1.065 *21*; α(N)=0.244 *5*; α(O)=0.0327 *7*; α(P)=0.000854 *15* B(E1)(W.u.)=4.37×10^{-5} *18*
49.9	$(2)^-$	49.8[#]	100	0.0	$(1)^-$	M1[@]		6.82	α(L)=5.27 *8*; α(M)=1.205 *17*; α(N)=0.292 *4*; α(O)=0.0490 *7*; α(P)=0.00358 *5*
74.6	$(2)^+$	54.4[#]		20.10	1^+	M1[@]		5.26	α(L)=4.06 *6*; α(M)=0.929 *13*; α(N)=0.225 *4*; α(O)=0.0378 *6*; α(P)=0.00276 *4*
		74.6[#]		0.0	$(1)^-$	E1[@]		0.800	α(K)=0.640 *9*; α(L)=0.1238 *18*; α(M)=0.0285 *4*; α(N)=0.00674 *10*; α(O)=0.001036 *15* α(P)=4.78×10^{-5} *7*
218.2		218.2		0.0	$(1)^-$				
249.9		31.6		218.2					
		200.1		49.9	$(2)^-$				
		250.0		0.0	$(1)^-$				
349.2		329.0		20.10	1^+				
		349.1		0.0	$(1)^-$				
401.7		183.8		218.2					
		401.5		0.0	$(1)^-$				
668.7		319.4		349.2					
		450.4		218.2					
717.1		48.2		668.7					
		667.0		49.9	$(2)^-$				
		717.4		0.0	$(1)^-$				
x+45.8	(6^+)	45.8 *5*	100	0.0+x	(5^+)				
x+70.6	(7^+)	(25.0)		x+45.8	(6^+)				Mult.: M1 is consistent with non observation of the 25γ.
x+123.4	(7^+)	77.5 *2*	100	x+45.8	(6^+)	M1[a]		10.73 *17*	α(K)=8.86 *14*; α(L)=1.443 *23*; α(M)=0.330 *6*; α(N)=0.0800 *13*; α(O)=0.01344 *22* α(P)=0.000981 *16*
x+162.8	(8^+)	92.2 *6*	100	x+70.6	(7^+)	M1		6.53 *16*	α(K)=5.40 *13*; α(L)=0.872 *21*; α(M)=0.199 *5*; α(N)=0.0483 *12*; α(O)=0.00812 *20* α(P)=0.000593 *14*
x+177.8	(7^-)	132.0[c] *3*	100	x+45.8	(6^+)				
x+205.2	8^+	42.4 *3*	11 *5*	x+162.8	(8^+)	M1[a]		10.9 *3*	α(L)=8.46 *22*; α(M)=1.93 *5*; α(N)=0.469 *12*; α(O)=0.0787 *20*; α(P)=0.00574 *15*
		134.5 *2*	100 *25*	x+70.6	(7^+)	M1+E2		1.8 *5*	α(K)=1.1 *7*; α(L)=0.47 *18*; α(M)=0.11 *5*; α(N)=0.027 *11*; α(O)=0.0041 *14*; α(P)=0.00012 *8*
x+230.1	(8^+)	106.3 *5*	100 *30*	x+123.4	(7^+)	M1+E2[&]	−0.10 *9*	4.33 *9*	α(K)=3.56 *10*; α(L)=0.59 *4*; α(M)=0.136 *9*; α(N)=0.0328 *22*; α(O)=0.0055 *3* α(P)=0.000390 *12*
		184.3 *1*	47 *15*	x+45.8	(6^+)	E2		0.422	α(K)=0.210 *3*; α(L)=0.1610 *23*; α(M)=0.0404 *6*; α(N)=0.00963 *14*; α(O)=0.001404 *20*

$^{180}_{75}Re_{105}$-5

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(P)=1.79×10^{-5} *3* I_γ: other: 150 *30* in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ).
x+266.6	(8$^-$)	88.5 *2*	100	x+177.8	(7$^-$)	M1(+E2)	−0.04 *4*	7.34 *12*	α(K)=6.06 *10*; α(L)=0.987 *23*; α(M)=0.226 *6*; α(N)=0.0548 *14*; α(O)=0.00919 *20* α(P)=0.000666 *11* Mult.: D(+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ), Δπ=no from level scheme.
x+284.2	9$^-$	79.1 *2*	16 *3*	x+205.2	8$^+$	E1		0.695 *11*	α(K)=0.558 *9*; α(L)=0.1054 *17*; α(M)=0.0242 *4*; α(N)=0.00574 *9*; α(O)=0.000886 *14* α(P)=4.17×10^{-5} *7* B(E1)(W.u.)=6.1×10^{-7} *13* I_γ: from ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ). Other: 2.6 *5* from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ).
		121.4 *2*	100 *8*	x+162.8	(8$^+$)	E1		0.232	α(K)=0.190 *3*; α(L)=0.0327 *5*; α(M)=0.00748 *11*; α(N)=0.00178 *3*; α(O)=0.000282 *5* α(P)=1.496×10^{-5} *22* B(E1)(W.u.)=1.05×10^{-6} *12*
x+312.3	(9$^+$)	149.3 *2*	100 *10*	x+162.8	(8$^+$)	M1+E2[&]	+0.23 *2*	1.610 *25*	α(K)=1.315 *21*; α(L)=0.228 *4*; α(M)=0.0525 *9*; α(N)=0.01272 *22*; α(O)=0.00211 *4* α(P)=0.0001428 *23*
		241.8 *1*	24.5 *23*	x+70.6	(7$^+$)				
x+363.2	(9$^+$)	133.2 *2*	29 *6*	x+230.1	(8$^+$)	M1(+E2)	−0.05 *6*	2.28	α(K)=1.88 *3*; α(L)=0.303 *6*; α(M)=0.0694 *14*; α(N)=0.0168 *4*; α(O)=0.00282 *5* α(P)=0.000205 *4* Mult.: D(+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ), Δπ=no from level scheme.
		239.7 *2*	100 *14*	x+123.4	(7$^+$)	E2		0.176	α(K)=0.1047 *15*; α(L)=0.0545 *8*; α(M)=0.01353 *20*; α(N)=0.00323 *5*; α(O)=0.000478 *7* α(P)=9.37×10^{-6} *14*
x+370.9	(9$^-$)	104.1 *1*	100 *15*	x+266.6	(8$^-$)	M1(+E2)	−0.02 *4*	4.61	α(K)=3.81 *6*; α(L)=0.614 *10*; α(M)=0.1405 *24*; α(N)=0.0341 *6*; α(O)=0.00572 *9* α(P)=0.000417 *6* Mult.: D(+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ), Δπ=no from level scheme.
		193.3 *2*	40 *9*	x+177.8	(7$^-$)				
x+414.1	9$^+$	208.7 *2*	100 *11*	x+205.2	8$^+$	M1+E2[&]	+0.21 *2*	0.629 *10*	α(K)=0.518 *8*; α(L)=0.0855 *13*; α(M)=0.0196 *3*; α(N)=0.00476 *7*; α(O)=0.000794 *12* α(P)=5.61×10^{-5} *9*
		251.3 *1*	7.1 *11*	x+162.8	(8$^+$)				E_γ,I_γ: observed only in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ).
x+418.6	10$^-$	134.4 *1*	100 *11*	x+284.2	9$^-$	M1+E2[&]		1.8 *5*	α(K)=1.2 *7*; α(L)=0.47 *18*; α(M)=0.11 *5*; α(N)=0.027 *12*; α(O)=0.0041 *14*; α(P)=0.00012 *9*
x+495.1	(10$^+$)	182.5 *2*	100 *16*	x+312.3	(9$^+$)	M1+E2[&]	+0.41 *9*	0.86 *3*	α(K)=0.70 *4*; α(L)=0.130 *3*; α(M)=0.0303 *9*; α(N)=0.00732 *21*;

$^{180}_{75}Re_{105}$-6

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(O)=0.001198 *25* α(P)=7.5×10^{-5} *4*
x+495.1	(10$^+$)	332.5 *4*	46 *5*	x+162.8	(8$^+$)	E2		0.0652	α(K)=0.0446 *7*; α(L)=0.01571 *23*; α(M)=0.00384 *6*; α(N)=0.000919 *14*; α(O)=0.0001395 *21* α(P)=4.22×10^{-6} *6*
x+523.1	(10$^+$)	159.7 *2*	25 *8*	x+363.2	(9$^+$)	M1+E2[&]	−0.37 *23*	1.28 *10*	α(K)=1.03 *12*; α(L)=0.195 *18*; α(M)=0.045 *5*; α(N)=0.0110 *12*; α(O)=0.00179 *14* α(P)=0.000111 *15*
		210.9 *3*	32 *6*	x+312.3	(9$^+$)				
		293.0 *2*	100 *17*	x+230.1	(8$^+$)	E2		0.0946	α(K)=0.0617 *9*; α(L)=0.0250 *4*; α(M)=0.00615 *9*; α(N)=0.001472 *21*; α(O)=0.000221 *4* α(P)=5.73×10^{-6} *8*
x+526.7	(10$^-$)	155.7 *1*	100 *6*	x+370.9	(9$^-$)				
		260.3 *2*	59 *10*	x+266.6	(8$^-$)	E2		0.1359	α(K)=0.0841 *12*; α(L)=0.0393 *6*; α(M)=0.00974 *14*; α(N)=0.00233 *4*; α(O)=0.000346 *5* α(P)=7.65×10^{-6} *11*
x+595.3	11$^-$	176.7 *1*	100 *8*	x+418.6	10$^-$				
		311.2 *2*	47 *5*	x+284.2	9$^-$				I$_\gamma$: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 10.7 *16* in ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ).
x+642.5	10$^+$	228.4 *1*	100 *9*	x+414.1	9$^+$	M1+E2[&]	+0.28 *5*	0.481 *11*	α(K)=0.395 *10*; α(L)=0.0662 *10*; α(M)=0.01522 *22*; α(N)=0.00369 *6*; α(O)=0.000614 *9* α(P)=4.26×10^{-5} *11*
		437.3 *1*	14 *3*	x+205.2	8$^+$	E2		0.0307	α(K)=0.0227 *4*; α(L)=0.00617 *9*; α(M)=0.001483 *21*; α(N)=0.000356 *5*; α(O)=5.53×10^{-5} *8* α(P)=2.22×10^{-6} *4*
x+672.2	(11$^-$)	145.4 *1*	77 *15*	x+526.7	(10$^-$)				I$_\gamma$: from ^{170}Er(^{14}N,4nγ), ^{181}Ta(α,5nγ). Other: Iγ(145γ)/Iγ(301.5γ)=4.1 *36* in ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ).
		301.5 *2*	100 *14*	x+370.9	(9$^-$)	(E2)		0.0868	α(K)=0.0573 *8*; α(L)=0.0225 *4*; α(M)=0.00552 *8*; α(N)=0.001321 *19*; α(O)=0.000199 *3* α(P)=5.34×10^{-6} *8*
x+696.5	(11$^+$)	173.4 *2*	13 *5*	x+523.1	(10$^+$)	M1+E2[&]	−1.3 *10*	0.7 *3*	α(K)=0.5 *4*; α(L)=0.18 *4*; α(M)=0.045 *11*; α(N)=0.011 *3*; α(O)=0.0016 *3*; α(P)=5.E−5 *5*
		201.6 *3*	40 *30*	x+495.1	(10$^+$)				
		333.3 *1*	100 *17*	x+363.2	(9$^+$)	E2		0.0647	α(K)=0.0443 *7*; α(L)=0.01557 *22*; α(M)=0.00380 *6*; α(N)=0.000911 *13*; α(O)=0.0001383 *20* α(P)=4.20×10^{-6} *6*
		384.3 *3*	37 *6*	x+312.3	(9$^+$)				
x+715.7	(11$^+$)	220.5 *1*	74 *11*	x+495.1	(10$^+$)	M1+E2[&]	+0.23 *3*	0.537 *9*	α(K)=0.442 *8*; α(L)=0.0731 *11*; α(M)=0.01679 *24*; α(N)=0.00407 *6*; α(O)=0.000679 *10* α(P)=4.79×10^{-5} *9* I$_\gamma$: from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ). Other: 143 *21* in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).

$^{180}_{75}Re_{105}$-7

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
x+715.7	(11$^+$)	352.6 *2*	55 *13*	x+363.2	(9$^+$)				
		403.3 *3*	100 *18*	x+312.3	(9$^+$)				
x+805.4	12$^-$	210.0 *1*	100 *4*	x+595.3	11$^-$	M1+E2[&]	+0.25 *3*	0.612 *10*	α(K)=0.503 *9*; α(L)=0.0842 *12*; α(M)=0.0193 *3*; α(N)=0.00469 *7*; α(O)=0.000781 *11* α(P)=5.44×10^{-5} *10*
		386.9 *1*	25 *4*	x+418.6	10$^-$	E2		0.0426	α(K)=0.0305 *5*; α(L)=0.00925 *13*; α(M)=0.00224 *4*; α(N)=0.000537 *8*; α(O)=8.26×10^{-5} *12* α(P)=2.95×10^{-6} *5*
x+888.5	11$^+$	245.9 *5*	100 *9*	x+642.5	10$^+$	M1+E2[a]	+0.20 *2*	0.400 *7*	α(K)=0.331 *6*; α(L)=0.0538 *9*; α(M)=0.01231 *19*; α(N)=0.00298 *5*; α(O)=0.000500 *8* α(P)=3.57×10^{-5} *6* δ: other: 0.9 *+5−3* from α(K)exp in ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ).
		474.4 *2*	44 *7*	x+414.1	9$^+$	E2		0.0249	α(K)=0.0187 *3*; α(L)=0.00477 *7*; α(M)=0.001140 *16*; α(N)=0.000274 *4*; α(O)=4.28×10^{-5} *6* α(P)=1.85×10^{-6} *3*
x+902.3	(12$^-$)	229.9 *1*	74 *13*	x+672.2	(11$^-$)				
		375.8 *1*	100 *17*	x+526.7	(10$^-$)	E2		0.0461	α(K)=0.0328 *5*; α(L)=0.01021 *15*; α(M)=0.00248 *4*; α(N)=0.000594 *9*; α(O)=9.11×10^{-5} *13* α(P)=3.16×10^{-6} *5*
x+905.5	(12$^+$)	382.4 *1*	100 *10*	x+523.1	(10$^+$)	E2		0.0440	α(K)=0.0314 *5*; α(L)=0.00962 *14*; α(M)=0.00233 *4*; α(N)=0.000559 *8*; α(O)=8.59×10^{-5} *12* α(P)=3.03×10^{-6} *5*
		410.5 *2*	30 *4*	x+495.1	(10$^+$)				
x+949.4	(12$^+$)	233.5 *2*	65 *8*	x+715.7	(11$^+$)				
		253.1 *3*	42 *8*	x+696.5	(11$^+$)				
		454.3 *2*	100 *17*	x+495.1	(10$^+$)	E2		0.0278	α(K)=0.0207 *3*; α(L)=0.00546 *8*; α(M)=0.001310 *19*; α(N)=0.000315 *5*; α(O)=4.90×10^{-5} *7* α(P)=2.04×10^{-6} *3*
x+1043.0	13$^-$	237.5 *1*	100 *8*	x+805.4	12$^-$	M1+E2[&]	+0.27 *4*	0.432 *8*	α(K)=0.356 *8*; α(L)=0.0592 *9*; α(M)=0.01360 *20*; α(N)=0.00329 *5*; α(O)=0.000549 *8* α(P)=3.84×10^{-5} *9*
		447.6 *1*	56 *4*	x+595.3	11$^-$	E2		0.0289	α(K)=0.0215 *3*; α(L)=0.00572 *8*; α(M)=0.001374 *20*; α(N)=0.000330 *5*; α(O)=5.14×10^{-5} *8* α(P)=2.11×10^{-6} *3*
x+1079.4	(13$^-$)	177.0 *2*	42 *11*	x+902.3	(12$^-$)				
		407.2 *2*	100 *10*	x+672.2	(11$^-$)				
x+1132.1	(13$^+$)	416.3 *2*	26 *12*	x+715.7	(11$^+$)				
		435.6 *1*	100 *17*	x+696.5	(11$^+$)	E2		0.0311	α(K)=0.0229 *4*; α(L)=0.00625 *9*; α(M)=0.001502 *21*; α(N)=0.000361 *5*; α(O)=5.60×10^{-5} *8* α(P)=2.24×10^{-6} *4*
x+1150.0	12$^+$	261.5 *1*	100 *13*	x+888.5	11$^+$				I_γ: from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ). 261.5γ is multiply placed with undivided intensity in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).

$^{180}_{75}Re_{105}$-8

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α	Comments
x+1150.0	12^+	507.4 *1*	30 *7*	x+642.5	10^+	E2[a]		0.0211	α(K)=0.01603 *23*; α(L)=0.00388 *6*; α(M)=0.000924 *13*; α(N)=0.000222 *4*; α(O)=3.49×10^{-5} *5* α(P)=1.588×10^{-6} *23*
x+1204.9	(13^+)	255.5 *1*	100 *16*	x+949.4	(12^+)				
		489.3 *2*	67 *12*	x+715.7	(11^+)				I_γ: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 140 *30* in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		508.4 *2*	9.8 *24*	x+696.5	(11^+)				
x+1304.4	14^-	261.1 *4*	82 *8*	x+1043.0	13^-	M1+E2[&]		0.24 *11*	α(K)=0.19 *11*; α(L)=0.042 *4*; α(M)=0.0100 *5*; α(N)=0.00241 *13*; α(O)=0.00038 *5* α(P)=1.9×10^{-5} *12* I_γ: from ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ). 261γ is multiply placed with undivided intensity in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		499.0 *1*	100 *9*	x+805.4	12^-				
x+1379.2	(14^+)	473.7 *3*	100	x+905.5	(12^+)	(E2)		0.0250	α(K)=0.0188 *3*; α(L)=0.00479 *7*; α(M)=0.001146 *17*; α(N)=0.000275 *4*; α(O)=4.30×10^{-5} *6* α(P)=1.85×10^{-6} *3*
x+1386.8	(14^-)	307.6 *2*	26 *6*	x+1079.4	(13^-)				
		484.5 *2*	100 *14*	x+902.3	(12^-)				
x+1403.0	(12^-)	807.8 *2*	30 *7*	x+595.3	11^-				
		984.6 *2*	100 *15*	x+418.6	10^-	E2		0.00488	α(K)=0.00399 *6*; α(L)=0.000686 *10*; α(M)=0.0001581 *23*; α(N)=3.82×10^{-5} *6*; α(O)=6.27×10^{-6} *9* α(P)=4.00×10^{-7} *6*
x+1425.3	13^+	275.2 *1*	100 *11*	x+1150.0	12^+	M1+E2[&]	+0.33 *7*	0.283 *9*	α(K)=0.233 *8*; α(L)=0.0388 *7*; α(M)=0.00891 *14*; α(N)=0.00216 *4*; α(O)=0.000360 *7* α(P)=2.50×10^{-5} *9*
		536.8 *2*	50 *6*	x+888.5	11^+	E2		0.0184	α(K)=0.01411 *20*; α(L)=0.00328 *5*; α(M)=0.000779 *11*; α(N)=0.000187 *3*; α(O)=2.96×10^{-5} *5* α(P)=1.402×10^{-6} *20*
x+1482.3	(14^+)	277.5 *2*	52 *10*	x+1204.9	(13^+)	M1+E2[&]	+0.19 *3*	0.288 *5*	α(K)=0.238 *4*; α(L)=0.0384 *6*; α(M)=0.00878 *13*; α(N)=0.00213 *3*; α(O)=0.000357 *6* α(P)=2.57×10^{-5} *5*
		532.9 *4*	100 *20*	x+949.4	(12^+)	E2		0.0187	α(K)=0.01434 *21*; α(L)=0.00335 *5*; α(M)=0.000796 *12*; α(N)=0.000191 *3*; α(O)=3.02×10^{-5} *5* α(P)=1.425×10^{-6} *20*
x+1566.8	13^+	141.3 *2*	18 *3*	x+1425.3	13^+	M1		1.93	α(K)=1.595 *24*; α(L)=0.256 *4*; α(M)=0.0584 *9*; α(N)=0.01417 *21*; α(O)=0.00238 *4* α(P)=0.000174 *3* B(M1)(W.u.)=5.4×10^{-6} *10*
		163.9 *1*	30 *4*	x+1403.0	(12^-)	E1		0.1071	α(K)=0.0883 *13*; α(L)=0.01456 *21*; α(M)=0.00333 *5*; α(N)=0.000795 *12* α(O)=0.0001273 *18*; α(P)=7.25×10^{-6} *11* B(E1)(W.u.)=5.6×10^{-8} *8*

$^{180}_{75}Re_{105}$-9

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
x+1566.8	13$^+$	262.4 *1*	18 *4*	x+1304.4	14$^-$	[E1]		0.0327	α(K)=0.0272 *4*; α(L)=0.00428 *6*; α(M)=0.000975 *14*; α(N)=0.000234 *4*; α(O)=3.81×10^{-5} *6* α(P)=2.37×10^{-6} *4* B(E1)(W.u.)=8.2×10^{-9} *19*
		416.8 *1*	100 *8*	x+1150.0	12$^+$	M1		0.0987	α(K)=0.0821 *12*; α(L)=0.01285 *18*; α(M)=0.00293 *5*; α(N)=0.000711 *10* α(O)=0.0001196 *17*; α(P)=8.81×10^{-6} *13* B(M1)(W.u.)=1.18×10^{-6} *12* Mult.: other: M1+E2 with δ=1.0 *2* from α(K)exp in ^{176}Yb(^{10}B,6nγ),^{174}Yb(^{11}B,5nγ).
		523.6 *2*	32 *4*	x+1043.0	13$^-$	[E1]		0.00669	α(K)=0.00561 *8*; α(L)=0.000836 *12*; α(M)=0.000189 *3*; α(N)=4.56×10^{-5} *7*; α(O)=7.56×10^{-6} *11* α(P)=5.17×10^{-7} *8* B(E1)(W.u.)=1.83×10^{-9} *25*
		678.3 *2*	84 *8*	x+888.5	11$^+$	E2		0.01070	α(K)=0.00848 *12*; α(L)=0.001707 *24*; α(M)=0.000400 *6*; α(N)=9.64×10^{-5} *14* α(O)=1.550×10^{-5} *22*; α(P)=8.49×10^{-7} *12* B(E2)(W.u.)=0.000212 *23*
		761.1 *3*	21 *4*	x+805.4	12$^-$	[E1]		0.00312	α(K)=0.00263 *4*; α(L)=0.000382 *6*; α(M)=8.63×10^{-5} *12*; α(N)=2.08×10^{-5} *3*; α(O)=3.47×10^{-6} *5* α(P)=2.46×10^{-7} *4* B(E1)(W.u.)=3.9×10^{-10} *8*
x+1586.1	(15$^-$)	199.2 *4*	9 *4*	x+1386.8	(14$^-$)				
		506.5 *2*	100 *17*	x+1079.4	(13$^-$)	E2		0.0212	α(K)=0.01609 *23*; α(L)=0.00390 *6*; α(M)=0.000929 *13*; α(N)=0.000223 *4*; α(O)=3.51×10^{-5} *5* α(P)=1.594×10^{-6} *23*
x+1587.5	15$^-$	283.2 *6*	26 *16*	x+1304.4	14$^-$	M1+E2[&]	+0.15 *4*	0.275 *5*	α(K)=0.228 *4*; α(L)=0.0364 *6*; α(M)=0.00832 *13*; α(N)=0.00202 *3*; α(O)=0.000338 *6* α(P)=2.46×10^{-5} *5* I_γ: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 130 *15* in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		544.5 *1*	100 *8*	x+1043.0	13$^-$	E2		0.01776	α(K)=0.01366 *20*; α(L)=0.00314 *5*; α(M)=0.000746 *11*; α(N)=0.000180 *3*; α(O)=2.84×10^{-5} *4* α(P)=1.359×10^{-6} *19*
x+1643.4	(15$^+$)	511.3 *1*	100	x+1132.1	(13$^+$)				
x+1669.8	(13$^-$)	1074.4 *3*	100	x+595.3	11$^-$				
x+1701.2	14$^-$	134.4 *1*	100 *11*	x+1566.8	13$^+$	E1		0.179	α(K)=0.1466 *21*; α(L)=0.0248 *4*; α(M)=0.00567 *8*; α(N)=0.001353 *20*; α(O)=0.000215 *3* α(P)=1.171×10^{-5} *17* B(E1)(W.u.)>1.3×10^{-5}
		895.3 *8*	5.3 *13*	x+805.4	12$^-$				

$^{180}_{75}Re_{105}$-10

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
x+1712.0	14$^+$	286.7 *1*	100 *19*	x+1425.3	13$^+$	M1+E2[&]	+0.34 *8*	0.252 *9*	α(K)=0.207 *8*; α(L)=0.0345 *7*; α(M)=0.00793 *13*; α(N)=0.00192 *4*; α(O)=0.000320 *7* α(P)=2.23×10^{-5} *9*
		562.1 *2*	79 *11*	x+1150.0	12$^+$	E2		0.01647	α(K)=0.01273 *18*; α(L)=0.00287 *4*; α(M)=0.000679 *10*; α(N)=0.0001635 *23* α(O)=2.59×10^{-5} *4*; α(P)=1.268×10^{-6} *18*
x+1755.6	15$^-$	54.8 *5*		x+1701.2	14$^-$	M1[a]		5.15 *16*	α(L)=3.98 *13*; α(M)=0.91 *3*; α(N)=0.221 *7*; α(O)=0.0370 *12*; α(P)=0.00270 *9*
		(85.4)	[b]	x+1669.8	(13$^-$)				
x+1768.1	(15$^+$)	286.0 *3*	66 *12*	x+1482.3	(14$^+$)	M1+E2[&]		0.19 *9*	α(K)=0.15 *8*; α(L)=0.031 *5*; α(M)=0.0074 *7*; α(N)=0.00179 *18*; α(O)=0.00029 *5* α(P)=1.5×10^{-5} *10*
		563.2 *2*	100 *5*	x+1204.9	(13$^+$)				
x+1846.9	(14$^+$)	280.2 *1*	100	x+1566.8	13$^+$	M1+E2[&]	+2.2 *7*	0.139 *25*	α(K)=0.098 *23*; α(L)=0.0310 *12*; α(M)=0.00752 *21*; α(N)=0.00180 *6*; α(O)=0.000277 *13* α(P)=1.0×10^{-5} *3*
x+1876.1	16$^+$	120.5 *1*	100	x+1755.6	15$^-$	E1		0.237	α(K)=0.194 *3*; α(L)=0.0333 *5*; α(M)=0.00763 *11*; α(N)=0.00182 *3*; α(O)=0.000287 *4* α(P)=1.523×10^{-5} *22*
x+1888.6	16$^-$	301.1 *1*		x+1587.5	15$^-$	(M1+E2)		0.16 *8*	α(K)=0.13 *7*; α(L)=0.027 *5*; α(M)=0.0063 *8*; α(N)=0.00152 *20*; α(O)=0.00024 *5* α(P)=1.3×10^{-5} *8* Mult.: (D+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ), Δπ=no from level scheme.
		584.2 *1*	100	x+1304.4	14$^-$	E2		0.01504	α(K)=0.01169 *17*; α(L)=0.00257 *4*; α(M)=0.000607 *9*; α(N)=0.0001461 *21*; α(O)=2.32×10^{-5} *4* α(P)=1.166×10^{-6} *17*
x+1926.5	(16$^+$)	547.3 *1*	100	x+1379.2	(14$^+$)				
x+1930.2	15$^-$	229.0 *1*	100	x+1701.2	14$^-$				
x+1969.0	(16$^-$)	382.5[c] *3*	74 *25*	x+1586.1	(15$^-$)				
		582.3 *2*	100 *50*	x+1386.8	(14$^-$)				
x+2008.1	15$^+$	296.1 *1*	79 *16*	x+1712.0	14$^+$	M1+E2[&]	+0.10 *2*	0.245	α(K)=0.203 *3*; α(L)=0.0323 *5*; α(M)=0.00737 *11*; α(N)=0.00179 *3*; α(O)=0.000300 *5* α(P)=2.20×10^{-5} *4*
		583.0 *2*	100 *24*	x+1425.3	13$^+$	E2		0.01511	α(K)=0.01174 *17*; α(L)=0.00258 *4*; α(M)=0.000611 *9*; α(N)=0.0001470 *21*; α(O)=2.34×10^{-5} *4* α(P)=1.171×10^{-6} *17*
x+2045.7	16$^-$	290.3 *3*	100	x+1755.6	15$^-$	(M1)		0.260	α(K)=0.216 *3*; α(L)=0.0342 *5*; α(M)=0.00780 *12*; α(N)=0.00189 *3*; α(O)=0.000318 *5* α(P)=2.34×10^{-5} *4* Mult.: (D) from γ(θ) in ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ), Δπ=no from level scheme.

$^{180}_{75}Re_{105}$-11

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
x+2075.4	(16$^+$)	307.4 *3*	100 *10*	x+1768.1	(15$^+$)				
		593.1 *3*	76 *18*	x+1482.3	(14$^+$)				I_γ: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 175 *60* in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
x+2140.0	17$^+$	263.9 *1*	100	x+1876.1	16$^+$	M1+E2[&]	+0.50 *16*	0.296 *22*	α(K)=0.240 *21*; α(L)=0.0430 *10*; α(M)=0.00995 *17*; α(N)=0.00241 *5*; α(O)=0.000396 *11* α(P)=2.57×10^{-5} *24*
x+2148.5	(15$^+$)	301.6 *2*	64 *13*	x+1846.9	(14$^+$)				
		581.5 *2*	100 *17*	x+1566.8	13$^+$				
x+2161.5	16$^-$	231.2 *1*	100 *14*	x+1930.2	15$^-$	M1+E2[&]	+0.34 *8*	0.456 *15*	α(K)=0.373 *15*; α(L)=0.0639 *9*; α(M)=0.01472 *22*; α(N)=0.00356 *5*; α(O)=0.000591 *9* α(P)=4.02×10^{-5} *17*
		460.5 *2*	31 *6*	x+1701.2	14$^-$				
x+2186.4	(17$^-$)	600.3 *2*	100 *18*	x+1586.1	(15$^-$)				
x+2205.6	17$^-$	316.9 *2*	49 *10*	x+1888.6	16$^-$	M1+E2[&]	+0.42 *14*	0.186 *12*	α(K)=0.153 *11*; α(L)=0.0257 *9*; α(M)=0.00591 *17*; α(N)=0.00143 *4*; α(O)=0.000238 *9* α(P)=1.64×10^{-5} *13*
		618.3 *2*	100 *10*	x+1587.5	15$^-$	E2		0.01318	α(K)=0.01033 *15*; α(L)=0.00219 *3*; α(M)=0.000517 *8*; α(N)=0.0001244 *18*; α(O)=1.99×10^{-5} *3* α(P)=1.033×10^{-6} *15*
x+2222.8	(17$^+$)	579.4 *2*	100	x+1643.4	(15$^+$)	E2		0.01533	α(K)=0.01190 *17*; α(L)=0.00263 *4*; α(M)=0.000622 *9*; α(N)=0.0001497 *21*; α(O)=2.38×10^{-5} *4* α(P)=1.187×10^{-6} *17*
x+2310.0	16$^+$	301.9 *1*	100 *12*	x+2008.1	15$^+$				
		598.0 *2*	65 *12*	x+1712.0	14$^+$	E2[a]		0.01424	α(K)=0.01111 *16*; α(L)=0.00240 *4*; α(M)=0.000568 *8*; α(N)=0.0001367 *20*; α(O)=2.18×10^{-5} *3* α(P)=1.109×10^{-6} *16*
x+2356.7	17$^-$	310.9 *1*	100 *10*	x+2045.7	16$^-$				
		601.1 *2*	74[b] *9*	x+1755.6	15$^-$				
x+2375.7	(17$^+$)	300.5 *5*	60 *7*	x+2075.4	(16$^+$)				
		607.4 *5*	100 *12*	x+1768.1	(15$^+$)	E2		0.01373	α(K)=0.01074 *16*; α(L)=0.00230 *4*; α(M)=0.000543 *8*; α(N)=0.0001308 *19*; α(O)=2.09×10^{-5} *3* α(P)=1.073×10^{-6} *16*
x+2416.1	18$^+$	276.1 *2*	100 *9*	x+2140.0	17$^+$	M1+E2[a]	0.70 *+15−20*	0.238 *24*	α(K)=0.190 *23*; α(L)=0.0366 *12*; α(M)=0.00855 *20*; α(N)=0.00206 *5*; α(O)=0.000336 *13* α(P)=2.0×10^{-5} *3* δ: from α(K)exp in ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: +0.6 *3* from γ(θ) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		540.0 *1*	28 *4*	x+1876.1	16$^+$	E2		0.0181	α(K)=0.01392 *20*; α(L)=0.00322 *5*; α(M)=0.000765 *11*; α(N)=0.000184 *3*; α(O)=2.91×10^{-5} *4* α(P)=1.384×10^{-6} *20*
x+2421.2	17$^-$	259.8 *2*	100 *11*	x+2161.5	16$^-$				

$^{180}_{75}Re_{105}$-12

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
x+2421.2	17⁻	491.1 *3*	47 *15*	x+1930.2	15⁻				
x+2474.3	(16⁺)	325.7 *2*	55 *26*	x+2148.5	(15⁺)				E_γ: from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). Other: 324.5 *2* in ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ).
		627.5 *2*	100 *26*	x+1846.9	(14⁺)				E_γ: from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). Other: 626.1 *2* in ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ).
x+2533.0	18⁻	327.3[c] *1*	45 *9*	x+2205.6	17⁻	(M1+E2)		0.13 *6*	α(K)=0.10 *6*; α(L)=0.021 *4*; α(M)=0.0048 *8*; α(N)=0.00117 *20*; α(O)=0.00019 *4* α(P)=1.1×10^{-5} *7* Mult.: (D+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ), Δπ=no from level scheme.
		644.4 *1*	100 *10*	x+1888.6	16⁻	E2		0.01200	α(K)=0.00945 *14*; α(L)=0.00196 *3*; α(M)=0.000460 *7*; α(N)=0.0001109 *16* α(O)=1.776×10^{-5} *25*; α(P)=9.46×10^{-7} *14*
x+2537.2	(18⁺)	610.7 *2*	100	x+1926.5	(16⁺)				
x+2617.1	17⁺	307.1 *1*	58 *7*	x+2310.0	16⁺				I_γ: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 116 *21* from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		608.9 *2*	100 *13*	x+2008.1	15⁺				
x+2633.1	(18⁻)	664.1 *2*	100	x+1969.0	(16⁻)				
x+2683.8	18⁻	327.1 *2*	100 *15*	x+2356.7	17⁻	(M1+E2)		0.13 *6*	α(K)=0.10 *6*; α(L)=0.021 *4*; α(M)=0.0049 *8*; α(N)=0.00117 *20*; α(O)=0.00019 *5* α(P)=1.1×10^{-5} *7* Mult.: (D+Q) from γ(θ) in ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ), Δπ=no from level scheme.
		638.1 *1*	63 *15*	x+2045.7	16⁻	(E2)		0.01227	α(K)=0.00965 *14*; α(L)=0.00201 *3*; α(M)=0.000473 *7*; α(N)=0.0001139 *16*; α(O)=1.82×10^{-5} *3* α(P)=9.66×10^{-7} *14*
x+2693.6	(18⁺)	317.9 *1*		x+2375.7	(17⁺)				
		618.2 *2*	*b*	x+2075.4	(16⁺)				
x+2707.4	19⁺	291.2 *2*	100 *17*	x+2416.1	18⁺	M1+E2	+0.47 *14*	0.229 *15*	α(K)=0.187 *14*; α(L)=0.0324 *9*; α(M)=0.00747 *17*; α(N)=0.00181 *5*; α(O)=0.000299 *9* α(P)=2.00×10^{-5} *16*
		567.5 *3*	66 *9*	x+2140.0	17⁺	E2		0.01610	α(K)=0.01246 *18*; α(L)=0.00279 *4*; α(M)=0.000661 *10*; α(N)=0.0001589 *23* α(O)=2.52×10^{-5} *4*; α(P)=1.242×10^{-6} *18*
x+2710.4	18⁻	289.6 *3*	100 *20*	x+2421.2	17⁻				
		548.4 *3*	96 *18*	x+2161.5	16⁻	E2		0.01746	α(K)=0.01345 *19*; α(L)=0.00308 *5*; α(M)=0.000731 *11*; α(N)=0.0001758 *25* α(O)=2.78×10^{-5} *4*; α(P)=1.338×10^{-6} *19* I_γ: from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ). Other: 22 *18* from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ).
x+2861.0	(19⁺)	638.2 *2*	100	x+2222.8	(17⁺)	(E2)		0.01226	α(K)=0.00965 *14*; α(L)=0.00201 *3*; α(M)=0.000473 *7*;

$^{180}_{75}Re_{105}$-13

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(N)=0.0001139 *16*; α(O)=1.82×10^{-5} *3* α(P)=9.65×10^{-7} *14*
x+2867.4	(19$^-$)	681.0 *3*	100	x+2186.4	(17$^-$)				
x+2872.7	19$^-$	339.7 *2*	39 *6*	x+2533.0	18$^-$	M1+E2[&]		0.12 *6*	α(K)=0.09 *5*; α(L)=0.018 *4*; α(M)=0.0043 *8*; α(N)=0.00104 *20*; α(O)=0.00017 *4* α(P)=1.0×10^{-5} *6*
		667.1 *1*	100 *11*	x+2205.6	17$^-$				
x+2922.3	18$^+$	305.2 *2*	25 *6*	x+2617.1	17$^+$				I$_\gamma$: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 160 *40* from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		612.3 *2*	100 *15*	x+2310.0	16$^+$				
x+3002.7	19$^-$	292.1 *4*	100 *50*	x+2710.4	18$^-$				
		319.2 *4*	[b]	x+2683.8	18$^-$				
		581.5 *1*	80 *30*	x+2421.2	17$^-$				
x+3015.0	20$^+$	307.5 *1*	100 *10*	x+2707.4	19$^+$	M1+E2[a]	1.2 *+5−3*	0.140 *22*	α(K)=0.108 *20*; α(L)=0.0243 *14*; α(M)=0.00576 *25*; α(N)=0.00139 *7*; α(O)=0.000221 *14* α(P)=1.12×10^{-5} *23*
		599.2 *3*	85 *17*	x+2416.1	18$^+$	E2[a]		0.01417	α(K)=0.01106 *16*; α(L)=0.00239 *4*; α(M)=0.000565 *8*; α(N)=0.0001359 *20*; α(O)=2.17×10^{-5} *3* α(P)=1.104×10^{-6} *16*
x+3051.9	18$^+$	(912.2 *3*)	27 *6*	x+2140.0	17$^+$				
		1175.8 *1*	100 *30*	x+1876.1	16$^+$	E2[a]		0.00344	α(K)=0.00284 *4*; α(L)=0.000463 *7*; α(M)=0.0001062 *15*; α(N)=2.57×10^{-5} *4*; α(O)=4.25×10^{-6} *6* α(P)=2.84×10^{-7} *4*
x+3069.0	(18$^+$)	929.0 *2*	100 *13*	x+2140.0	17$^+$				
		1192.9 *2*	100 *30*	x+1876.1	16$^+$	(E2)[a]		0.00335	α(K)=0.00276 *4*; α(L)=0.000449 *7*; α(M)=0.0001029 *15*; α(N)=2.49×10^{-5} *4*; α(O)=4.12×10^{-6} *6* α(P)=2.77×10^{-7} *4*
x+3122.8	(18$^+$)	982.8 *2*	32 *7*	x+2140.0	17$^+$				
		1246.7 *1*	100 *24*	x+1876.1	16$^+$				
x+3203.2	(20$^+$)	666.0 *2*	100	x+2537.2	(18$^+$)	(E2)		0.01114	α(K)=0.00881 *13*; α(L)=0.00179 *3*; α(M)=0.000421 *6*; α(N)=0.0001013 *15* α(O)=1.627×10^{-5} *23*; α(P)=8.82×10^{-7} *13*
x+3209.9	20$^-$	337.2 *2*	50 *15*	x+2872.7	19$^-$	M1+E2[&]		0.12 *6*	α(K)=0.09 *5*; α(L)=0.019 *4*; α(M)=0.0044 *8*; α(N)=0.00107 *20*; α(O)=0.00017 *4* α(P)=1.0×10^{-5} *6*
		676.7 *2*	100 *18*	x+2533.0	18$^-$				
x+3234.7	(19$^+$)	312.5 *3*	18 *6*	x+2922.3	18$^+$				I$_\gamma$: from ^{176}Yb(^{10}B,6nγ),^{176}Yb(^{11}B,5nγ). Other: 150 *40* from ^{170}Er(^{14}N,4nγ),^{181}Ta(α,5nγ).
		617.4 *5*	100 *13*	x+2617.1	17$^+$	(E2)		0.01323	α(K)=0.01036 *15*; α(L)=0.00220 *4*; α(M)=0.000519 *8*; α(N)=0.0001249 *18*; α(O)=1.99×10^{-5} *3* α(P)=1.036×10^{-6} *15*

$^{180}_{75}Re_{105}$-14

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	δ ‡	α	Comments
x+3327.5	20⁻	325.1 *3*	100 *40*	x+3002.7	19⁻				
		616.9 *4*	50 *40*	x+2710.4	18⁻				
x+3339.4	21⁺	324.4 *4*	98 *27*	x+3015.0	20⁺	M1+E2	+0.53 *21*	0.166 *17*	α(K)=0.135 *16*; α(L)=0.0235 *12*; α(M)=0.00542 *23*; α(N)=0.00131 *6*; α(O)=0.000217 *12* α(P)=1.45×10^{-5} *18*
		632.0 *2*	100 *21*	x+2707.4	19⁺	E2		0.01254	α(K)=0.00985 *14*; α(L)=0.00206 *3*; α(M)=0.000486 *7*; α(N)=0.0001170 *17*; α(O)=1.87×10^{-5} *3* α(P)=9.86×10^{-7} *14*
x+3353.1?	(20⁻)	720.0[c] *2*	100	x+2633.1	(18⁻)				
x+3369.6	(19⁻)	300.5 *4*	80 *30*	x+3069.0	(18⁺)				
		317.7 *4*	100 *30*	x+3051.9	18⁺				
		1164.1 *3*	23 *7*	x+2205.6	17⁻				
x+3408.5	(20⁺)	285.7 *1*	100	x+3122.8	(18⁺)	E2[a]		0.1020	α(K)=0.0659 *10*; α(L)=0.0275 *4*; α(M)=0.00678 *10*; α(N)=0.001620 *23*; α(O)=0.000243 *4* α(P)=6.09×10^{-6} *9*
x+3471.8	21⁻	(62.9)	[b]	x+3408.5	(20⁺)				
		102.2 *1*	18 *8*	x+3369.6	(19⁻)	E2[a]		3.78	α(K)=0.811 *12*; α(L)=2.24 *4*; α(M)=0.570 *9*; α(N)=0.1354 *20*; α(O)=0.0193 *3* α(P)=7.35×10^{-5} *11* B(E2)(W.u.)=0.009 *5*
		456.8 *6*	100 *8*	x+3015.0	20⁺	E1[a]		0.00898	α(K)=0.00752 *11*; α(L)=0.001133 *17*; α(M)=0.000257 *4*; α(N)=6.19×10^{-5} *9* α(O)=1.022×10^{-5} *15*; α(P)=6.88×10^{-7} *10* B(E1)(W.u.)=1.3×10^{-10} *4*
x+3550.1	(21⁺)	689.1 *2*	100[b]	x+2861.0	(19⁺)				
x+3551.4	21⁻	341.5 *1*	64 *13*	x+3209.9	20⁻	M1+E2[&]		0.11 *6*	α(K)=0.09 *5*; α(L)=0.018 *4*; α(M)=0.0042 *8*; α(N)=0.00102 *20*; α(O)=0.00017 *4*; α(P)=9.E−6 *6*
		679.1 *2*	100 *11*	x+2872.7	19⁻	(E2)		0.01067	α(K)=0.00846 *12*; α(L)=0.001701 *24*; α(M)=0.000399 *6*; α(N)=9.61×10^{-5} *14* α(O)=1.545×10^{-5} *22*; α(P)=8.47×10^{-7} *12*
x+3616.0	(21⁻)	748.6 *2*	100	x+2867.4	(19⁻)				
x+3668.5	21⁻	341.0 *1*		x+3327.5	20⁻				
		665.7 *2*	[b]	x+3002.7	19⁻	(E2)		0.01115	α(K)=0.00882 *13*; α(L)=0.00179 *3*; α(M)=0.000421 *6*; α(N)=0.0001015 *15* α(O)=1.629×10^{-5} *23*; α(P)=8.83×10^{-7} *13*
x+3680.5	22⁺	341.0 *1*	100 *30*	x+3339.4	21⁺				
		665.6 *2*	100 *30*	x+3015.0	20⁺				
x+3851.3	22⁻	380.0 *4*	100	x+3471.8	21⁻				
x+3861.9	22⁻	310.5 *4*	45 *9*	x+3551.4	21⁻	M1+E2[&]		0.15 *7*	α(K)=0.12 *7*; α(L)=0.024 *5*; α(M)=0.0057 *8*; α(N)=0.00138 *20*; α(O)=0.00022 *5* α(P)=1.2×10^{-5} *8*

Adopted Levels, Gammas (continued)

γ(^{180}Re) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
x+3861.9	22^-	651.8 *2*	100 *17*	x+3209.9	20^-			
x+3895.8	(22^+)	424.0 *2*	100	x+3471.8	21^-			
x+3911.0	(22^+)	707.8 *4*	100	x+3203.2	(20^+)			
x+4025.7	22^-	357.1 *4*	82 *25*	x+3668.5	21^-			
		697.0 *10*	100 *35*	x+3327.5	20^-			
x+4038.0	23^+	357.8 *2*		x+3680.5	22^+			
		698.7 *2*	[b]	x+3339.4	21^+			
x+4205.8	23^-	343.9 *2*	100 *40*	x+3861.9	22^-	M1+E2[&]	0.11 *6*	α(K)=0.09 *5*; α(L)=0.018 *4*; α(M)=0.0042 *8*; α(N)=0.00100 *19*; α(O)=0.00016 *4*; α(P)=9.E−6 *6*
		654.6 *2*	92 *23*	x+3551.4	21^-			
x+4240.9	23^-	389.5 *2*	100 *60*	x+3851.3	22^-			
		768.3 *5*	60 *50*	x+3471.8	21^-			
x+4269.8	(23^+)	374.0 *1*	100	x+3895.8	(22^+)			
x+4300.2	(23^+)	750.1 *2*	100	x+3550.1	(21^+)			
x+4392.1	23^-	366.3 *3*	38 *20*	x+4025.7	22^-			
		724.1 *5*	100 *50*	x+3668.5	21^-			
x+4412.1?	(23^-)	796.0[c] *2*	100	x+3616.0	(21^-)			
x+4412.6	24^+	375.6 *4*	50 *22*	x+4038.0	23^+			
		731.7 *2*	100 *50*	x+3680.5	22^+			
x+4525.6	24^-	319.8 *2*	50 *30*	x+4205.8	23^-	M1+E2[&]	0.14 *7*	α(K)=0.11 *6*; α(L)=0.022 *4*; α(M)=0.0052 *8*; α(N)=0.00126 *20*; α(O)=0.00020 *5* α(P)=1.1×10^{-5} *7*
		663.2 *3*	100 *40*	x+3861.9	22^-			
x+4637.6	24^-	396.6 *1*	100 *50*	x+4240.9	23^-			
		786.8 *3*	19 *14*	x+3851.3	22^-			
x+4643.7	(24^+)	732.7 *5*	100	x+3911.0	(22^+)			
x+4651.8	(24^+)	381.9 *1*	100 *40*	x+4269.8	(23^+)			
		756.1 *3*	23 *13*	x+3895.8	(22^+)			
x+4802.0	25^+	389.2 *2*	100 *70*	x+4412.6	24^+			
		764.2 *2*	100 *50*	x+4038.0	23^+			
x+4888.7	(25^-)	363.0 *2*	67 *33*	x+4525.6	24^-	M1+E2[&]	0.10 *5*	α(K)=0.08 *5*; α(L)=0.015 *4*; α(M)=0.0035 *8*; α(N)=0.00085 *18*; α(O)=0.00014 *4*; α(P)=8.E−6 *5*
		683.2 *3*	100 *50*	x+4205.8	23^-			
x+5040.5	(25^+)	388.7 *2*	100 *40*	x+4651.8	(24^+)			
		771.2 *4*	50 *30*	x+4269.8	(23^+)			
x+5048.1	(25^-)	410.5 *5*	100	x+4637.6	24^-			
x+5102.9?	(25^+)	802.7[c] *2*	100	x+4300.2	(23^+)			
x+5206.2	26^+	404.2 *2*	[b]	x+4802.0	25^+			
		794.1 *2*	[b]	x+4412.6	24^+			
x+5436.1	(26^+)	395.7 *3*	100 *50*	x+5040.5	(25^+)			
		784.2 *4*	60 *30*	x+4651.8	(24^+)			
x+5455.3	(26^-)	407.2 *3*	100	x+5048.1	(25^-)			
x+5838.3	(27^+)	402.5 *6*	80 *50*	x+5436.1	(26^+)			

$^{180}_{75}Re_{105}$-16

Adopted Levels, Gammas (continued)

$\gamma(^{180}Re)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π
x+5838.3	(27^+)	797.7 *3*	100 *50*	x+5040.5	(25^+)
x+6249.9	(28^+)	411.7 *4*	*b*	x+5838.3	(27^+)
		813.5 *6*		x+5436.1	(26^+)
x+6673.6	(29^+)	423.7 *2*	*b*	x+6249.9	(28^+)
		835.6 *6*		x+5838.3	(27^+)

† Weighted average of $^{170}Er(^{14}N,4n\gamma)$,$^{181}Ta(\alpha,5n\gamma)$ and $^{176}Yb(^{10}B,6n\gamma)$,$^{174}Yb(^{11}B,5n\gamma)$, except where noted.
‡ From $\gamma(\theta)$, DCO ratios, and conversion electron data in $^{170}Er(^{14}N,4n\gamma)$,$^{181}Ta(\alpha,5n\gamma)$, except where noted.
# From ^{180}Os ε decay.
@ From ce data in ^{180}Os ε decay.
& D+Q from $\gamma(\theta)$ in $^{170}Er(^{14}N,4n\gamma)$, $^{181}Ta(\alpha,5n\gamma)$, $\Delta\pi$=no from level scheme.
a From ce data in $^{176}Yb(^{10}B,6n\gamma)$,$^{174}Yb(^{11}B,5n\gamma)$.
b Weak transition.
c Placement of transition in the level scheme is uncertain.

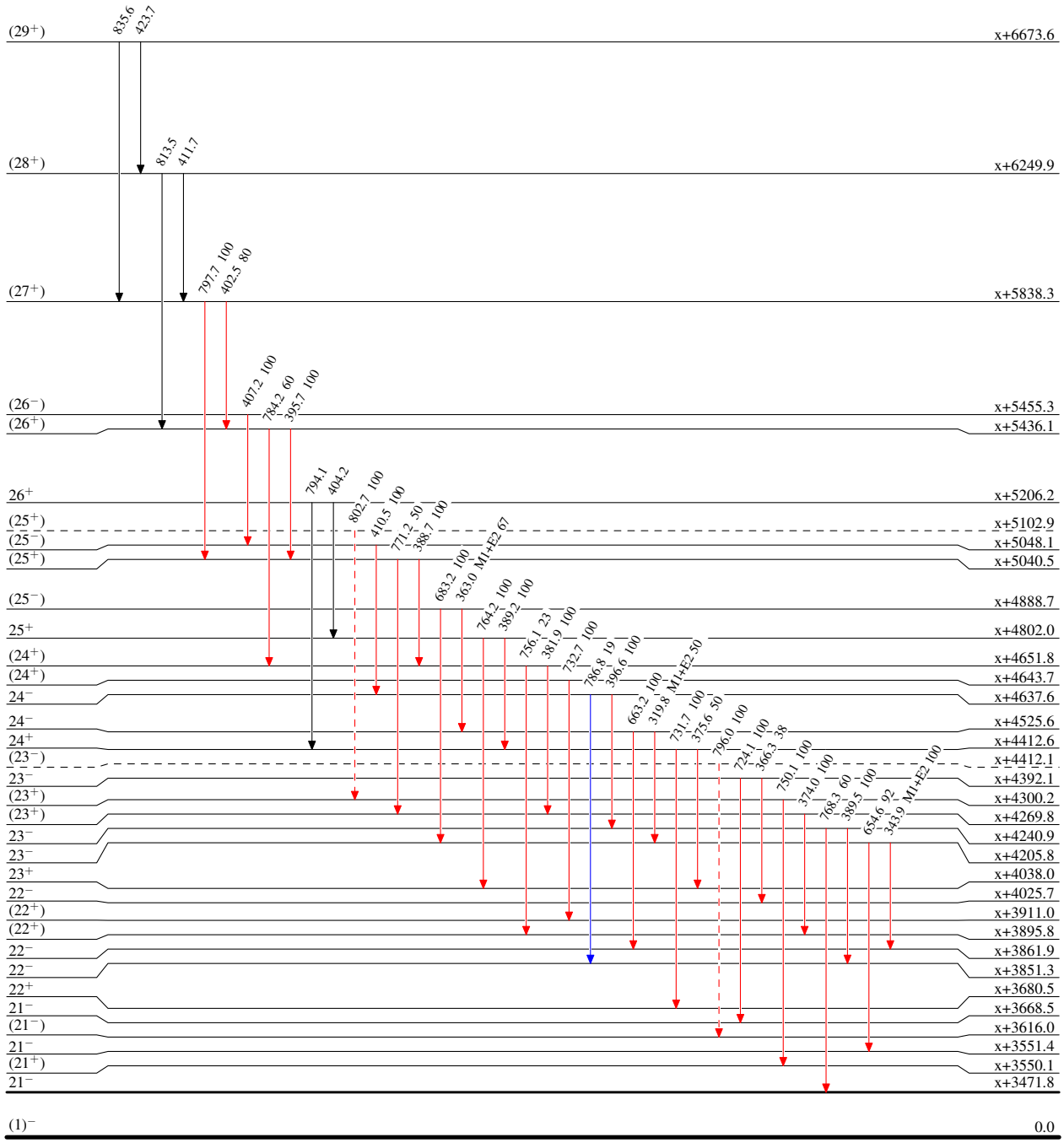
$^{180}_{75}Re_{105}$-17

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

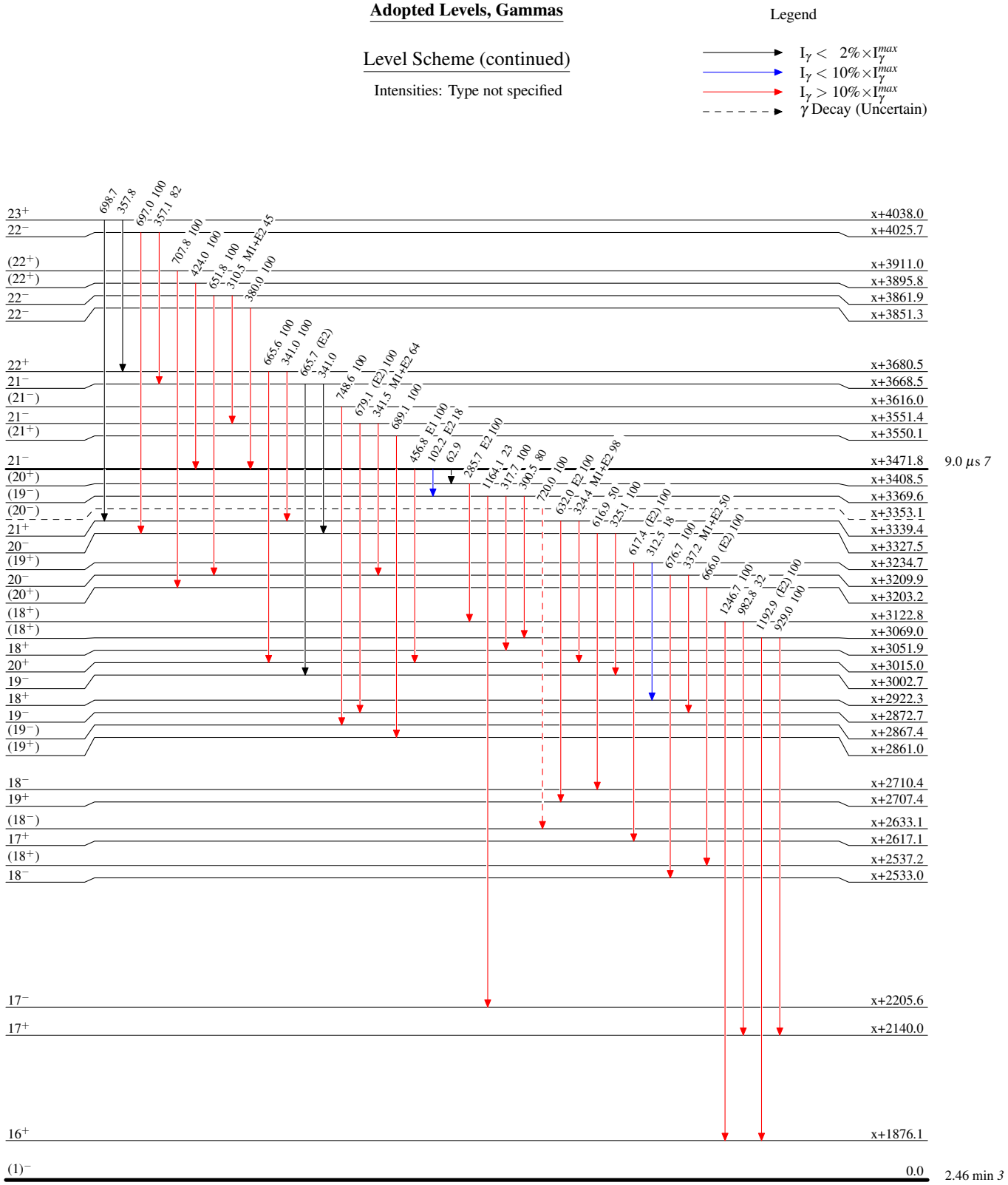


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

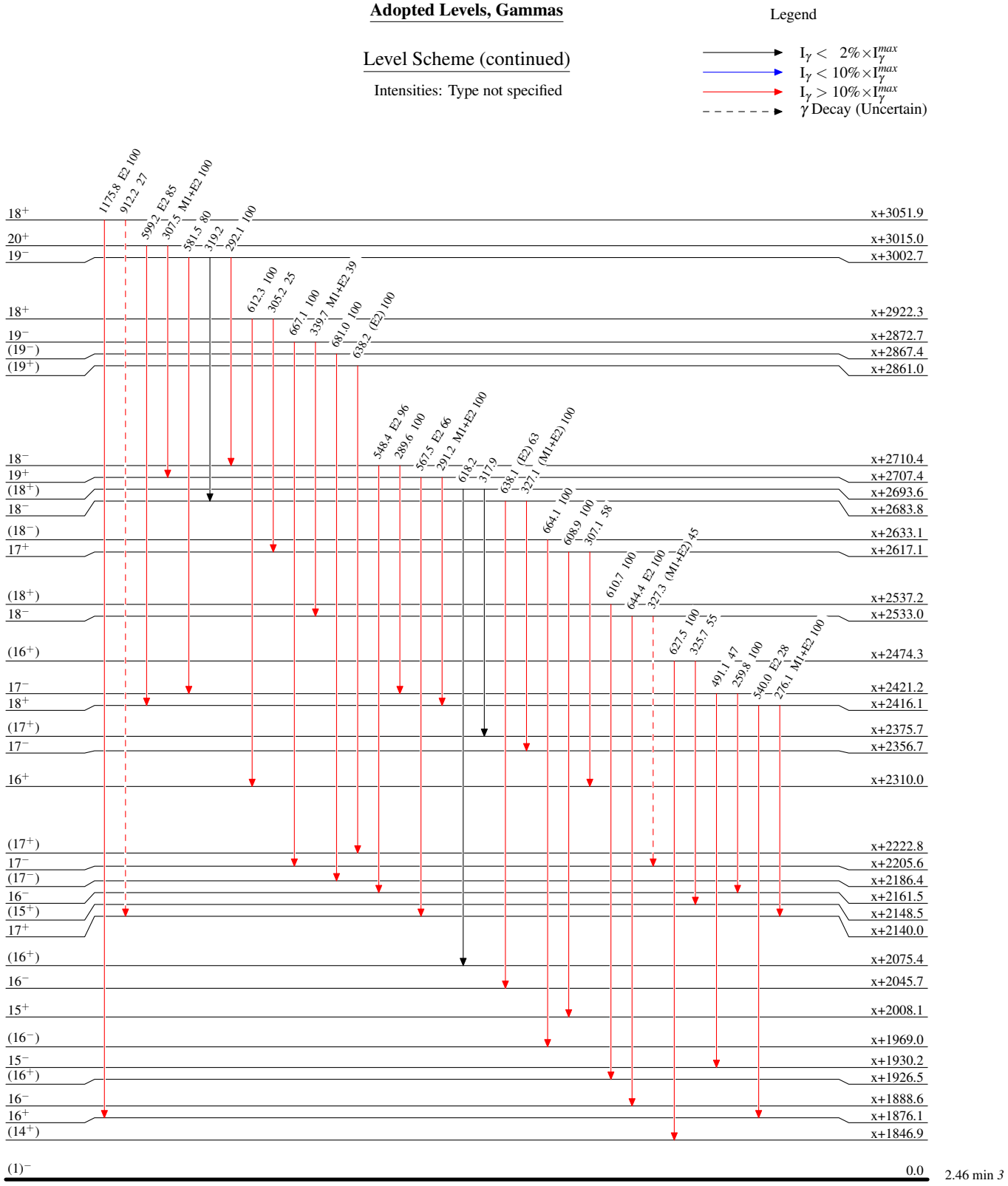


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

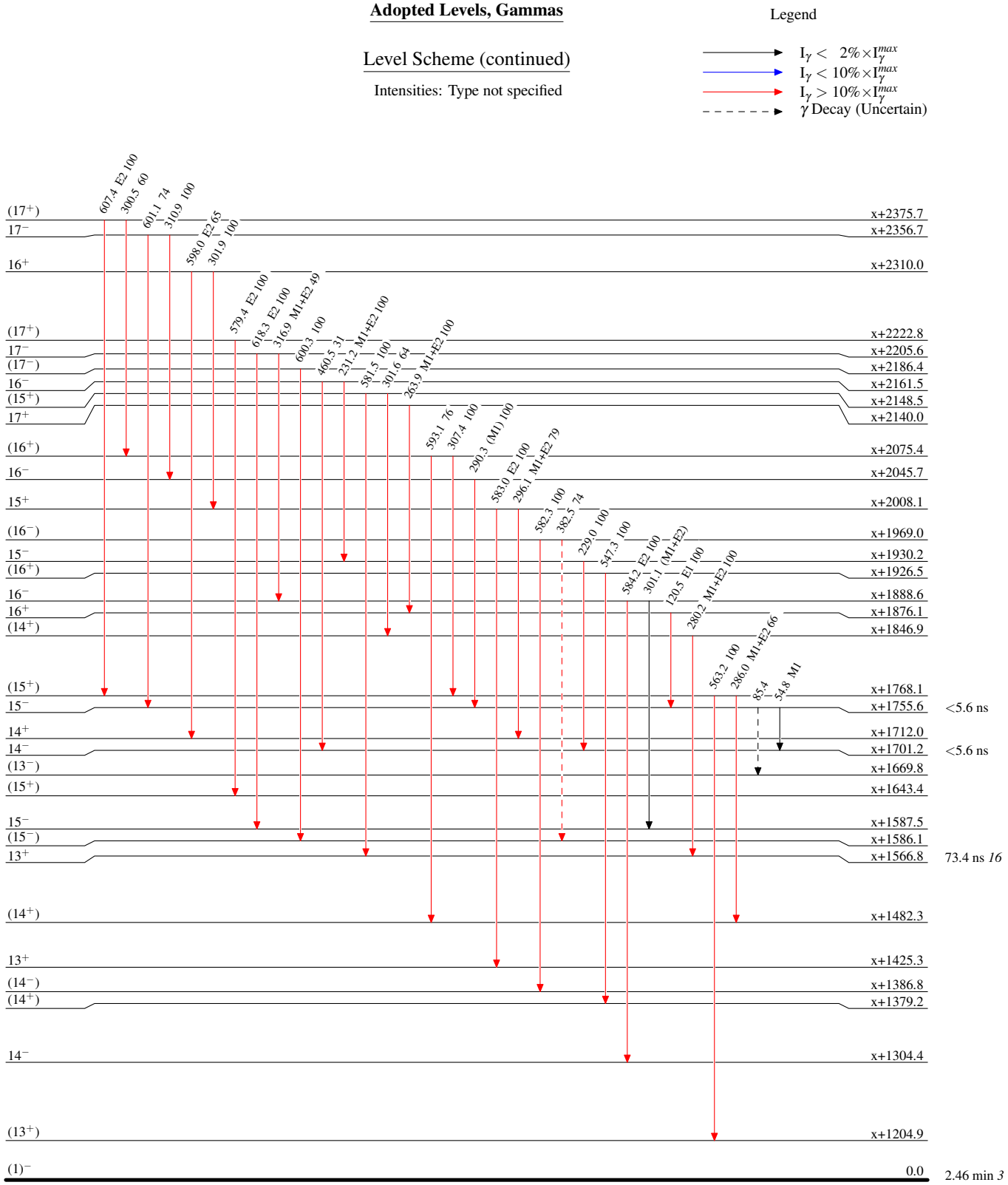


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

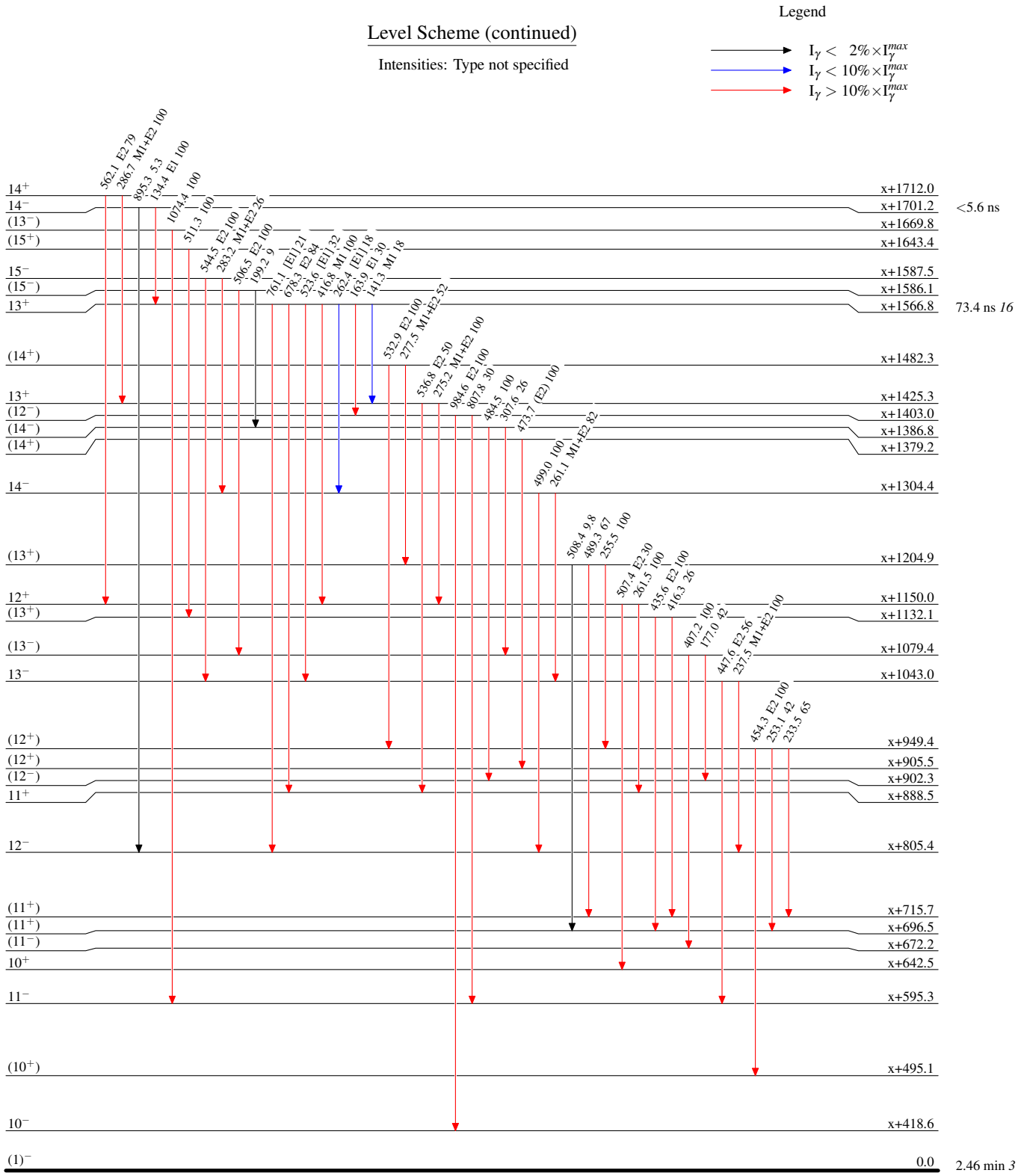


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

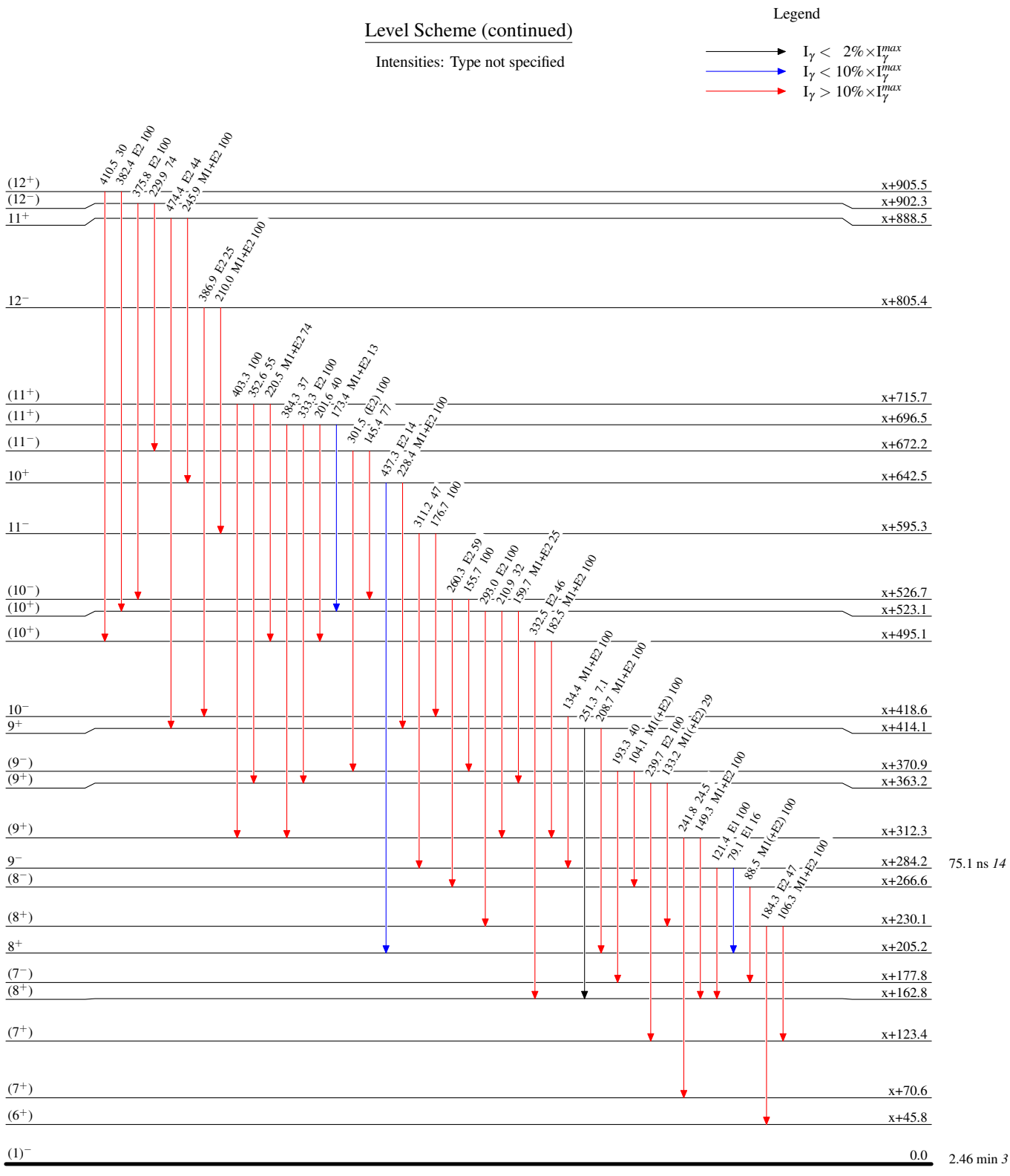


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

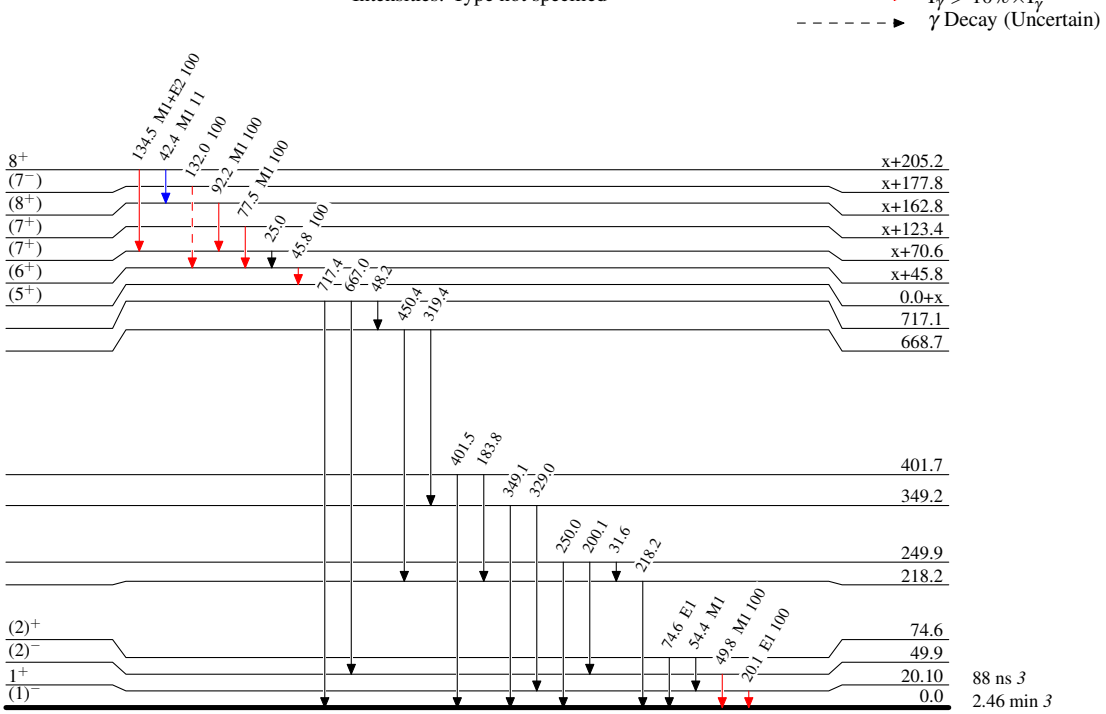


$^{180}_{75}Re_{105}$

Adopted Levels, Gammas

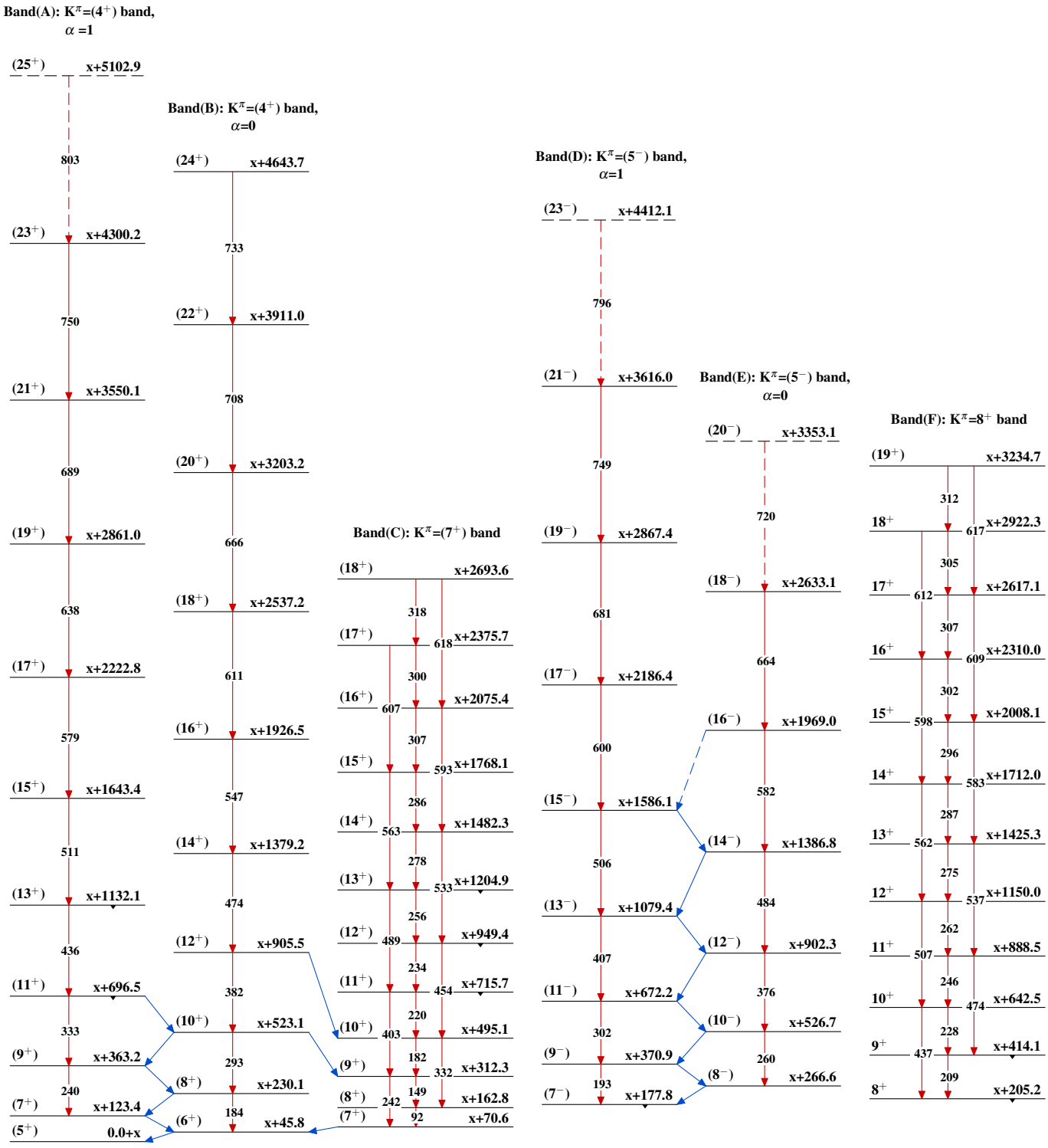
Level Scheme (continued)

Intensities: Type not specified



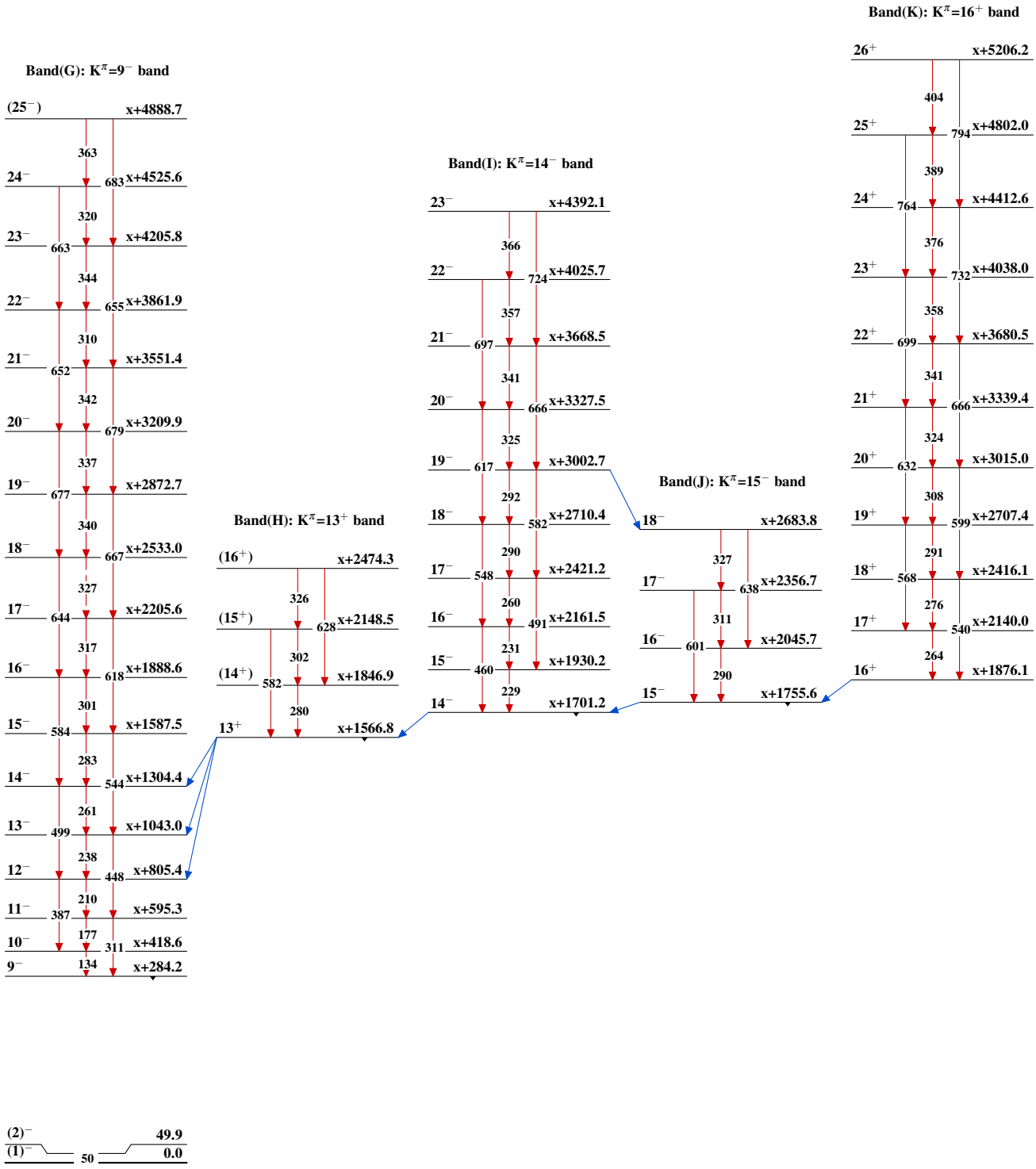
$^{180}_{75}Re_{105}$

Adopted Levels, Gammas



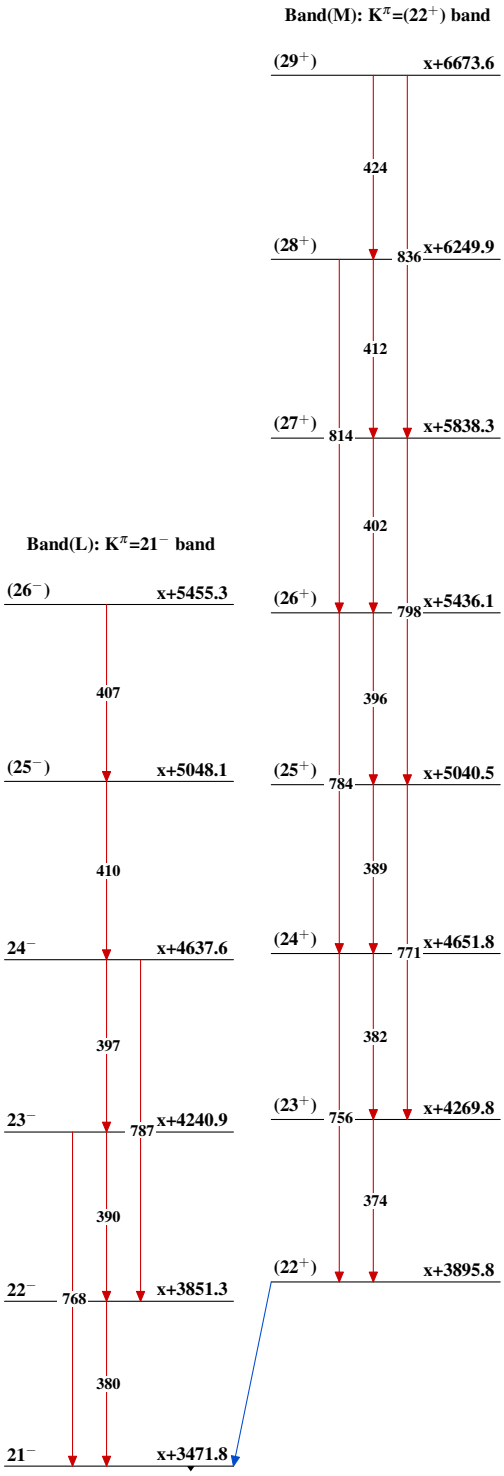
$^{180}_{75}Re_{105}$

Adopted Levels, Gammas (continued)



$^{180}_{75}Re_{105}$

Adopted Levels, Gammas (continued)



$^{180}_{75}Re_{105}$