

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,791 (2006)	15-Sep-2005

Q(β⁻)=-8.24×10³ 4; S(n)=1.006×10⁴ 3; S(p)=4.10×10³ 4; Q(α)=4.57×10³ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record -8240 3010060 304100 404570 40 [2003Au03](#).

¹⁷⁶Os Levels

Cross Reference (XREF) Flags

A	¹⁷⁶ Ir ε decay	D	¹⁵² Sm(²⁸ Si,4nγ)
B	¹⁸⁰ Pt α decay	E	¹⁶² Dy(²⁰ Ne,6nγ)
C	¹⁶⁴ Er(¹⁶ O,4nγ)		

E(level) [†]	J ^{π‡}	T _{1/2}	XREF	Comments
0.0 [#]	0 ⁺	3.6 min 5	ABCDE	%ε+%β ⁺ =100 T _{1/2} : from 1970DeZF . Other value: 3.0 min 7 (1970Ar15). Other: 1972Be89 .
135.1 [#] 7	2 ⁺		A CDE	J ^π : 135.1γ E2 to 0 ⁺ .
395.5 [#] 8	4 ⁺		A CDE	J ^π : 260.3γ E2 to 2 ⁺ , member of g.s. rotational band.
601.2 ^b 8	0 ⁺		A	J ^π : 601.3γ E0 to 0 ⁺ .
742.4 ^b 8	2 ⁺		A	J ^π : 607.2γ E0+E2+M1 to 2 ⁺ .
742.5 [#] 9	6 ⁺		A CDE	J ^π : 347.0γ E2 to 4 ⁺ , member of g.s. rotational band.
863.6 ^c 7	2 ⁺		A	J ^π : 728.5γ E0+E2+M1 to 2 ⁺ .
1025.6 ^b 8	4 ⁺		A	J ^π : 629.8γ E0 to 4 ⁺ .
1037.8 ^c 9	3 ⁺		A	J ^π : 642.2γ M1+E2 to 4 ⁺ , 902.6γ M1+E2 to 2 ⁺ .
1157.7 [#] 11	8 ⁺		A CDE	J ^π : 415.0γ E2 to 6 ⁺ , member of g.s. rotational band.
1224.0 ^c 9	4 ⁺		A	J ^π : 828.4γ M1+E2 to 4 ⁺ .
1349.7 ^{&} 9	(3) ⁻		A	J ^π : 1214.6γ E1+M2 to 2 ⁺ .
1409.5 ^c 10	5 ⁺		A	J ^π : 1014.0γ M1+E2 to 4 ⁺ , 667.2γ M1+E2 to 6 ⁺ .
1431.9 ^b 9	6 ⁺		A	J ^π : 689.4γ E0+E2+M1 to 6 ⁺ .
1475.1 ^{&} 10	(4) ⁻		A C	J ^π : 1079.6γ E1+M2 to 4 ⁺ , 437.4γ to 3 ⁺ .
1516.6 [@] 12	(5) ⁻		A C	J ^π : 774.0γ E1+M2 to 6 ⁺ , 1120.6γ to 4 ⁺ .
1634.1 [#] 13	10 ⁺		CDE	J ^π : 476.3γ E2 to 8 ⁺ state. Band member.
1708.0 ^{&} 11	(6) ⁻		A C	J ^π : Band member.
1753.8 [@] 11	(7) ⁻		A C	J ^π : Band member.
1929.7 10			A	
1978.8 ^a 14	(7)		C	J ^π : Band assignment.
2021.0 ^{&} 12	(8) ⁻		C	J ^π : 313.2γ E2 to (6) ⁻ state. Band member.
2076.1 [@] 12	(9) ⁻		C	J ^π : 322.4γ E2 to (7) ⁻ state. Band member.
2103.4 9			A	
2138.6 9			A	
2167.9 [#] 15	12 ⁺		CDE	J ^π : 533.8γ E2 to 10 ⁺ state. Band member.
2265.3 ^a 14	(9)		C	J ^π : 286.4γ E2 to (7) state. Band member.
2395.0 ^{&} 16	(10) ⁻		C	J ^π : 374.0γ (E2) to (8) ⁻ state. Band member.
2474.0 [@] 14	(11) ⁻		C	J ^π : 398.3γ E2 to (9) ⁻ state. Band member.
2571.2 16	(12) ⁺		C	J ^π : 937.1γ (E2) to 10 ⁺ state.
2621.7 ^a 18	(11)		C	J ^π : 356.4γ E2 to (9) state. Band member.
2754.8 [#] 18	14 ⁺		C E	J ^π : 586.8γ E2 to 12 ⁺ state. Band member.
2817.9 ^{&} 19	(12) ⁻		C	J ^π : 422.9γ E2 to (10) ⁻ state. Band member.
2937.8 [@] 17	(13) ⁻		C	J ^π : 463.8γ E2 to (11) ⁻ state. Band member.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{176}Os Levels (continued)

E(level) [†]	J ^π [‡]	XREF	Comments
3050.8 ^a 20	(13)	C	J ^π : 429.1γ E2 to (11) state. Band member.
3294.8 ^{&} 21	(14 ⁻)	C	
3381.5 [#] 20	16 ⁺	C E	J ^π : 626.8γ E2 to 14 ⁺ state. Band member.
3456.9 [@] 20	(15 ⁻)	C	J ^π : 519.1γ E2 to (13 ⁻) state. Band member.
3547.4 ^a 23	(15)	C	J ^π : 496.6γ E2 to (13) state. Band member.
3566.9 20	(16 ⁺)	C	J ^π : 812.1γ (E2) to 14 ⁺ state.
3829.5 ^{&} 24	(16 ⁻)	C	J ^π : Band member.
4019.2 [#] 22	18 ⁺	C	J ^π : 637.7γ E2 to 16 ⁺ state. Band member.
4023.8 [@] 22	(17 ⁻)	C	J ^π : 566.9γ E2 to (15 ⁻) state. Band member.
4100.0 ^a 25	(17)	C	J ^π : 552.6γ (E2) to (15) state. Band member.
4176.8 20	(18 ⁺)	C	J ^π : 795.3γ (E2) to 16 ⁺ state.
4420 ^{&} 3	(18 ⁻)	C	J ^π : 590.9γ (E2) to (16 ⁻) state. Band member.
4634.7 [@] 24	(19 ⁻)	C	J ^π : 610.9γ E2 to (17 ⁻) state. Band member.
4683.3 [#] 24	(20 ⁺)	C	J ^π : 664.1γ (E2) to 18 ⁺ state. Band member.
4699 ^a 3	(19)	C	
5043 ^{?&} 1	(20 ⁻)	C	
5287 [@] 3	(21 ⁻)	C	J ^π : 652.1γ (E2) to (19 ⁻) state. Band member.
5349 ^a 3	(21)	C	J ^π : 649.9γ (E2) to (19) state. Band member.
5399 [#] 3	(22 ⁺)	C	J ^π : 715.6γ (E2) to (20 ⁺) state. Band member.
5976 [@] 3	(23 ⁻)	C	
6057 ^a 3	(23)	C	
6147 [#] 3	(24 ⁺)	C	J ^π : 748.5γ (E2) to (22 ⁺) state. Band member.
6683 [@] 3	(25 ⁻)	C	

[†] Deduced by evaluator from a least squares fit to the γ-ray energies assuming ΔE=1 keV for all γ-ray energies.

[‡] Assignments are based on rotational band structure, γ-ray angular distributions, and level deexcitation patterns.

Band(A): K^π=0⁺ g.s. rotational band.

@ Band(B): rotational band 1.

& Band(C): rotational band 2.

^a Band(D): rotational band 3.

^b Band(E): K^π=0⁺ β vibrational band.

^c Band(F): K^π=2⁺ γ vibrational band.

Adopted Levels, Gammas (continued)

$E_i(\text{level})$	J_i^π	$\gamma(^{176}\text{Os})$							Comments
		E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult. [@]	δ	α^b	
135.1	2 ⁺	135.1	100	0.0	0 ⁺	E2			
395.5	4 ⁺	260.3	100	135.1	2 ⁺	E2			
601.2	0 ⁺	466.1 [‡]	100 [‡]	135.1	2 ⁺	E2&		0.0271	
		601.3 [‡]	[‡]	0.0	0 ⁺	E0&			
742.4	2 ⁺	141.2 [‡]	≈ 0.07 [‡]	601.2	0 ⁺				
		346.9 [‡]	100 [‡] 3	395.5	4 ⁺	E2&			
742.5	6 ⁺	607.2 [‡]	5.0 [‡] 5	135.1	2 ⁺	E0+E2+M1&	-4.2 +5-6	0.139 7	
		347.0	100	395.5	4 ⁺	E2			
863.6	2 ⁺	467.9 [‡]	9.0 [‡] 25	395.5	4 ⁺				
		728.5 [‡]	100 [‡] 8	135.1	2 ⁺	E0+E2+M1&	11 +0-5	0.018 3	
1025.6	4 ⁺	863.6 [‡]	63 [‡] 8	0.0	0 ⁺	E2&		0.00676	
		282.9 [‡]	19 [‡] 3	742.4	2 ⁺	E2&		0.110	
		283.1 [‡]	10 [‡] 3	742.5	6 ⁺				
		629.8 [‡]	100 [‡] 5	395.5	4 ⁺	E0+E2+M1&	-2.8 +2-3	0.092 5	
1037.8	3 ⁺	890.6 [‡]	0.8 [‡] 2	135.1	2 ⁺				
		642.2 [‡]	18.0 [‡] 24	395.5	4 ⁺	M1+E2&	-2.9 +5-7	0.0152 15	
1157.7	8 ⁺	902.6 [‡]	100 [‡] 8	135.1	2 ⁺	M1+E2&	-9 +3-5	0.0063 4	
		415.0	100	742.5	6 ⁺	E2			
1224.0	4 ⁺	360.3 [‡]	34 [‡] 11	863.6	2 ⁺				
		481.6 [‡]	25 [‡] 5	742.5	6 ⁺				
		828.4 [‡]	100 [‡] 10	395.5	4 ⁺	M1+E2&	+6 +0-4	0.0077 20	
		1088.8 [‡]	41 [‡] 5	135.1	2 ⁺	E2&		0.00422	
1349.7	(3) ⁻	312.0 [‡]	20 [‡] 10	1037.8	3 ⁺				
		485.9 [‡]	23 [‡] 7	863.6	2 ⁺				
1409.5	5 ⁺	1214.6 [‡]	100 [‡] 25	135.1	2 ⁺	E1+M2&	+0.3 2		
		371.6 [‡]	34 [‡] 8	1037.8	3 ⁺				
		667.2 [‡]	88 [‡] 12	742.5	6 ⁺	M1+E2&	-2.4 +10-14	0.015 7	
		1014.0 [‡]	100 [‡] 7	395.5	4 ⁺	M1+E2&	-22 +10-0	0.00486	
1431.9	6 ⁺	406.3 [‡]	47 [‡] 3	1025.6	4 ⁺				
		689.4 [‡]	100 [‡] 5	742.5	6 ⁺	E0+E2+M1&	-2.0 +2-3	0.053 8	α : experimental value.
1475.1	(4) ⁻	1036.4 [‡]	39 [‡] 5	395.5	4 ⁺	E2&		0.00464	
		437.4	26 4	1037.8	3 ⁺				
		1079.6	100 10	395.5	4 ⁺	E1+M2&	+0.1 +1-2	0.0019 6	α : experimental value.

Adopted Levels, Gammas (continued)

$\gamma(^{176}\text{Os})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. @	δ	α^b	Comments
1516.6	(5) ⁻	774.0	100 4	742.5	6 ⁺	E1+M2 &	+0.13 +10-9	0.0041 19	α : experimental value.
		1120.6 ^c	34 4	395.5	4 ⁺				
1634.1	10 ⁺	476.3	100	1157.7	8 ⁺	E2			
1708.0	(6) ⁻	233.0	22 5	1475.1	(4) ⁻				
		965.7	100 5	742.5	6 ⁺	(D) ^a			
1753.8	(7) ⁻	237.1	19 4	1516.6	(5) ⁻				
		596.2	100 9	1157.7	8 ⁺	D ^a			
		1011.4	9 1	742.5	6 ⁺	D ^a			
1929.7		1534.2 [#]		395.5	4 ⁺				
		1794.5 [#]		135.1	2 ⁺				
1978.8	(7)	225.0 ^c	≤25	1753.8	(7) ⁻				
		821.1	100 8	1157.7	8 ⁺	(D) ^a			
2021.0	(8) ⁻	313.2	100 3	1708.0	(6) ⁻	E2			
		863.1	≈33	1157.7	8 ⁺				
2076.1	(9) ⁻	322.4	100 3	1753.8	(7) ⁻	E2			
		442.2	31 5	1634.1	10 ⁺				
		918.4	30 3	1157.7	8 ⁺	(D) ^a			
2103.4		671.5 [#]		1431.9	6 ⁺				
		1077.5 [#]		1025.6	4 ⁺				
		1361.5 [#]		742.5	6 ⁺				
		1707.5 [#]		395.5	4 ⁺				
2138.6		706.5 [#]		1431.9	6 ⁺				
		1112.8 [#]		1025.6	4 ⁺				
		1396.0 [#]		742.5	6 ⁺				
		1743.5 [#]		395.5	4 ⁺				
2167.9	12 ⁺	533.8	100	1634.1	10 ⁺	E2			
2265.3	(9)	286.4	100 7	1978.8	(7)	E2			
		631.3	100 14	1634.1	10 ⁺	(D) ^a			
2395.0	(10) ⁻	374.0	100	2021.0	(8) ⁻	(E2)			
2474.0	(11) ⁻	306	6.4 13	2167.9	12 ⁺				
		398.3	100 4	2076.1	(9) ⁻	E2			
		839.7	7.0 13	1634.1	10 ⁺				
2571.2	(12 ⁺)	937.1	100	1634.1	10 ⁺	(E2)			
2621.7	(11)	356.4	100	2265.3	(9)	E2			
2754.8	14 ⁺	586.8	100	2167.9	12 ⁺	E2			
2817.9	(12) ⁻	422.9	100	2395.0	(10) ⁻	E2			
2937.8	(13) ⁻	463.8	100 4	2474.0	(11) ⁻	E2			
		768.9 ^c	≤14	2167.9	12 ⁺				

Adopted Levels, Gammas (continued)

γ(¹⁷⁶Os) (continued)

<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ[†]</u>	<u>I_γ[†]</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[@]</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ[†]</u>	<u>I_γ[†]</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[@]</u>
3050.8	(13)	429.1	100	2621.7	(11)	E2	4420	(18 ⁻)	590.9	100	3829.5	(16 ⁻)	(E2)
3294.8	(14 ⁻)	476.9	100	2817.9	(12 ⁻)		4634.7	(19 ⁻)	610.9	100	4023.8	(17 ⁻)	E2
3381.5	16 ⁺	626.8	100	2754.8	14 ⁺	E2	4683.3	(20 ⁺)	664.1	100	4019.2	18 ⁺	(E2)
3456.9	(15 ⁻)	519.1	100	2937.8	(13 ⁻)	E2	4699	(19)	599.0	100	4100.0	(17)	
3547.4	(15)	496.6	100	3050.8	(13)	E2	5043?	(20 ⁻)	623 ^c	100	4420	(18 ⁻)	
3566.9	(16 ⁺)	812.1	100	2754.8	14 ⁺	(E2)	5287	(21 ⁻)	652.1	100	4634.7	(19 ⁻)	(E2)
3829.5	(16 ⁻)	534.7	100	3294.8	(14 ⁻)		5349	(21)	649.9	100	4699	(19)	(E2)
4019.2	18 ⁺	637.7	100	3381.5	16 ⁺	E2	5399	(22 ⁺)	715.6	100	4683.3	(20 ⁺)	(E2)
4023.8	(17 ⁻)	566.9	100	3456.9	(15 ⁻)	E2	5976	(23 ⁻)	688.8	100	5287	(21 ⁻)	
4100.0	(17)	552.6	100	3547.4	(15)	(E2)	6057	(23)	708.3	100	5349	(21)	
4176.8	(18 ⁺)	609.8	≈69	3566.9	(16 ⁺)		6147	(24 ⁺)	748.5	100	5399	(22 ⁺)	(E2)
		795.3	100 10	3381.5	16 ⁺	(E2)	6683	(25 ⁻)	707.0	100	5976	(23 ⁻)	

[†] From ¹⁶⁴Er(¹⁶O,4nγ) (1982Dr03), unless otherwise specified.

[‡] From ¹⁷⁶Ir ε decay.

From ¹⁷⁶Ir ε decay.

@ Transitions from ¹⁶⁴Er(¹⁶O,4nγ), deduced to be quadrupole from their angular distribution coefficients, were assumed by 1990Br07 to be stretched E2.

& From measured conversion coefficients and angular correlation coefficients in ¹⁷⁶Ir ε decay.

^a From γ(θ) in ¹⁶⁴Er(¹⁶O,4nγ).

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

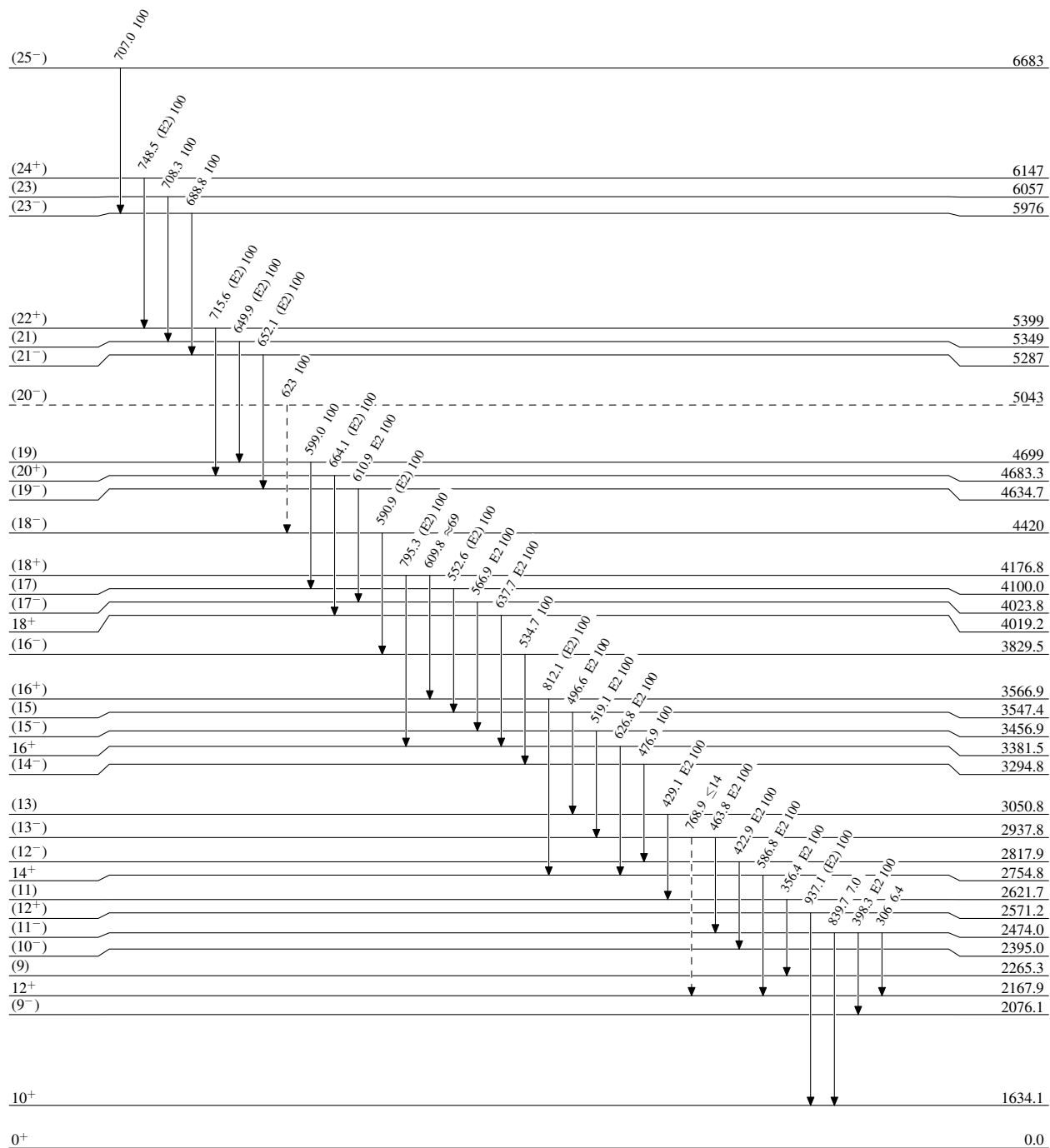
^c Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain)

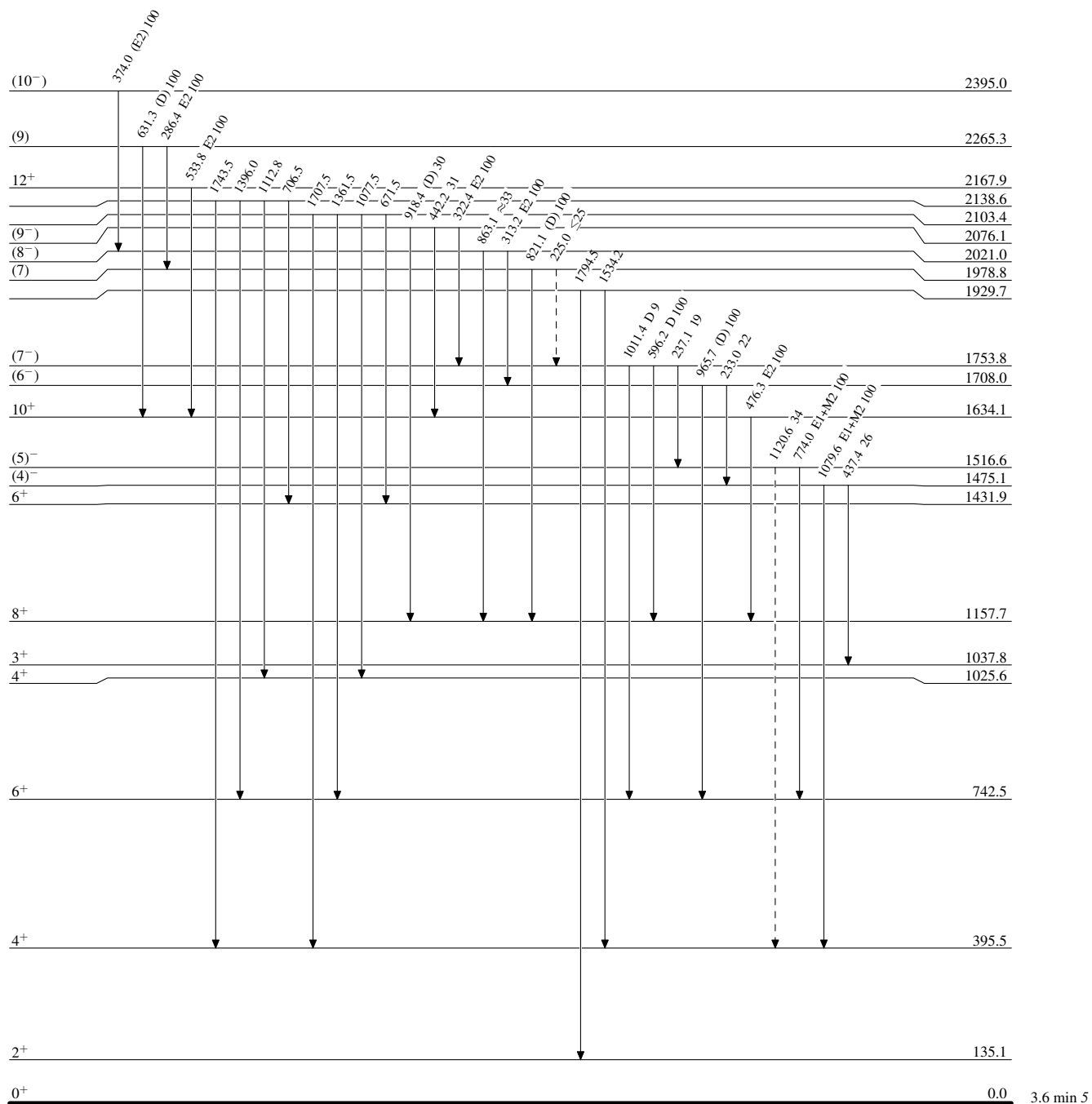
3.6 min 5

Adopted Levels, Gammas

Legend

Level Scheme (continued)

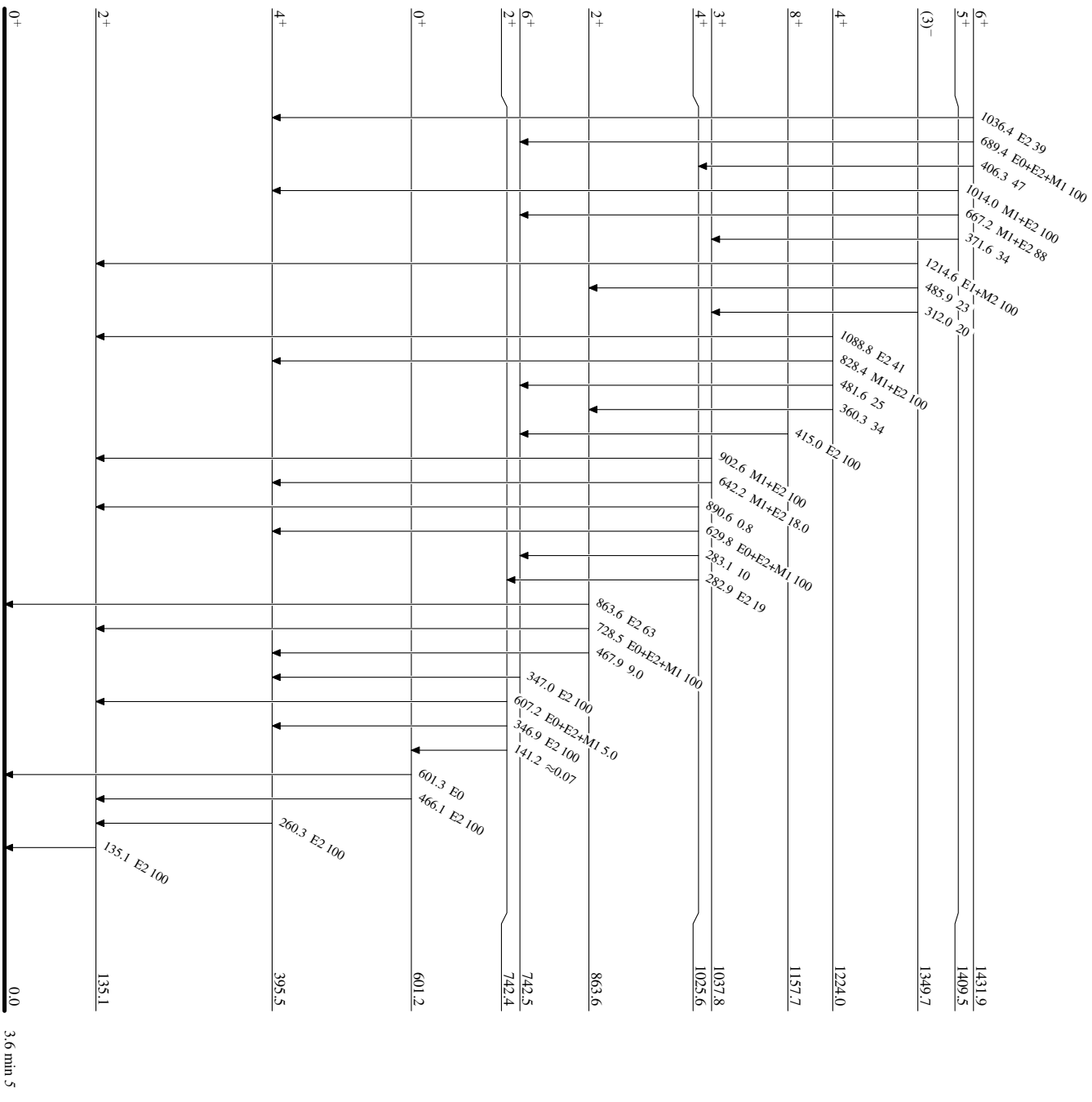
Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain) $^{176}_{76}\text{Os}_{100}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{176}\text{Os}_{100}$

3.6 mm 5

Adopted Levels, Gammas