

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, Huo Junde		NDS 87,15 (1999)	1-Nov-1998

$Q(\beta^-) = -9.13 \times 10^3$ 3; $S(n) = 10628$ 19; $S(p) = 3.73 \times 10^3$ 3; $Q(\alpha) = 4870$ 10 [2012Wa38](#)

Note: Current evaluation has used the following Q record -9.0E3 SY1.06E4 SY3.5E3 SY4872 10 [1995Au04](#).

Other reactions: $^{120}\text{Sn}(^{58}\text{Ni}, \alpha)$ ([1987Da15](#)); $^{89}\text{Y}(^{90}\text{Zr}, p\alpha)$ ([1988Go03](#)).

 ^{174}Os LevelsCross Reference (XREF) Flags

A	$^{51}\text{V}(^{127}\text{I}, 4n\gamma)$	D	^{174}Ir ε decay (7.9 s+4.9 s)
B	$^{146}\text{Nd}(^{32}\text{S}, 4n\gamma)$	E	^{178}Pt α decay
C	$^{150}\text{Sm}(^{28}\text{Si}, 4n\gamma), (^{29}\text{Si}, 5n\gamma)$		

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0@	0 ⁺	44 s 4	ABCDE	$T_{1/2}$: weighted average of 45 s 5 (1973Be67) and 42 s 6 (1972Be89). % ε =99.98 1; % α =0.02 1. % α : From 1971Bo06 .
158.60@ 10	2 ⁺	0.35 ns 4	ABCDE	
435.00@ 15	4 ⁺	18.2 ps 8	ABCD	
545.3 ^c 6	0 ⁺		D	
690.9& 3	2 ⁺		D	
777.63@ 22	6 ⁺	5.8 ps 6	ABCD	
846.2 ^d 7	2 ⁺		D	
989.4 ^c 5	4 ⁺		D	
1054.0 ^d 4	3 ⁺		D	
1171.93@ 23	8 ⁺	2.7 ps 6	ABCD	
1240.0 6			C	
1254.1 ^d 8	4 ⁺		D	
1417.6 5			C	
1420.1& 5	(3 ⁻)		D	
1424.9 ^c 7	6 ⁺		D	
1453.28 ^d 22	5 ⁺		BCD	
1549.75& 25	4 ⁻	35 [#] ps 21	ABCD	
1596.45& 23	5 ⁽⁻⁾	35 [#] ps 21	ABCD	J^π : may not be a band head (1990Fa02). It has been assigned as the J=5 member of a $K^\pi=3^-$ band in ^{174}Ir ε decay.
1617.5@ 3	10 ⁺	2.1 ps 2	ABCD	
1790.37& 22	6 ⁽⁻⁾	8 ps 4	ABCD	
1860.51& 25	7 ⁽⁻⁾	7.8 ps 16	ABCD	
2102.8& 3	8 ⁻	9.7 ps 18	ABC	
2113.8@ 3	12 ⁺	0.97 ps 14	ABC	
2149.4 ^b 4			C	
2205.66 ^a 25	9 ⁻	5.3 ps 8	ABC	
2271.9 6			C	
2410.1 ^b 3	(9)		BC	
2476.7& 4	10 ⁽⁻⁾	3.9 ps 7	ABC	
2613.8 ^a 3	11 ⁻	2.4 ps 3	ABC	
2622.5 6			C	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{174}Os Levels (continued)

E(level)	J^π [†]	$T_{1/2}$ [‡]	XREF	E(level)	J^π [†]	$T_{1/2}$ [‡]	XREF
2656.3 [@] 4	14 ⁺	0.49 ps 14	ABC	5262.1 ^a 6	21 ⁻	0.62 ps 17	ABC
2706.5 6			C	5430.3 ^b 13	(21)		B
2749.9 ^b 3	(11)		BC	5741.1 ^{&} 8	22 ⁻		BC
2905.8 6			C	5870.1 ^a 8	23 ⁻		BC
2906.7 ^{&} 4	12 ⁻	3.4 ps 6	ABC	5987.1 [@] 8	24 ⁺		BC
3074.1 ^a 3	13 ⁻	1.3 ps 2	ABC	6060.7 ^b 14	(23)		B
3163.3 ^b 4	(13)		BC	6428.0 ^{&} 9	24 ⁻		B
3239.8 [@] 4	16 ⁺	0.42 ps 7	ABC	6512.1 ^a 9	25 ⁻		BC
3389.1 ^{&} 5	14 ⁻	1.9 ps 3	ABC	6760.7 ^b 14	(25)		B
3577.6 ^a 4	15 ⁻	0.35 ps 21	ABC	6786.1 [@] 9	26 ⁺		BC
3663.5 ^b 4	(15)		BC	7190.0 ^{&} 10	26 ⁻		B
3861.8 [@] 5	18 ⁺	0.14 ps 7	ABC	7199.0 ^a 10	27 ⁻		B
3924.9 ^{&} 5	16 ⁽⁻⁾	0.8 ps 6	ABC	7628.4 [@] 11	28 ⁺		B
4114.7 ^a 4	17 ⁻	0.25 ps 15	ABC	7943.4 ^a 11	29 ⁻		B
4225.5 ^b 7	(17)		BC	8018.8 ^{&} 11	28 ⁻		B
4505.6 ^{&} 6	18 ⁻		BC	8511.6 [@] 12	30 ⁺		B
4524.9 [@] 5	20 ⁺	0.28 ps 14	ABC	8749.7 ^a 12	31 ⁻		B
4676.9 ^a 5	19 ⁻	0.76 ps 21	ABC	9429.7 [@] 13	32 ⁺		B
4825.3 ^b 8	(19)		BC	9618.3 ^a 13	33 ⁻		B
5112.1 ^{&} 6	20 ⁻		BC	10545.5 ^a 14	(35 ⁻)		B
5233.0 [@] 6	22 ⁺		ABC				

[†] Spin/parity values are evaluator's assignments based on rotational structure, $\gamma(\theta)$, and γ -ray decay patterns in $^{150}\text{Sm}(^{28}\text{Si},4n\gamma)$ ($^{29}\text{Si},5n\gamma$) and $^{146}\text{Nd}(^{32}\text{S},4n\gamma)$.

[‡] Measured with the recoil-distance technique in $^{51}\text{V}(^{127}\text{I},4n\gamma)$ (1987Ga12).

Combined $T_{1/2}$ for the 1551 and 1598 levels.

@ Band(A): $K^\pi=0^+$ g.s. rotational band.

& Band(B): $K^\pi=(3^-)$ rotational band.

^a Band(C): $K^\pi=(5^-)$ rotational band.

^b Band(D): rotational band.

^c Band(E): $K^\pi=0^+$ β -vibrational band.

^d Band(F): $K^\pi=2^+$ γ -vibrational band.

Adopted Levels, Gammas (continued)

$\gamma(^{174}\text{Os})$									
E _i (level)	J ^{π} _i	E _{γ} ^{$\ddagger$}	I _{γ} ^{$\ddagger$}	E _f	J ^{π} _f	Mult. ^{$\ddagger$@}	δ	α^e	Comments
158.60	2 ⁺	158.6 ^{&} 1	100 15	0.0	0 ⁺				
435.00	4 ⁺	276.4 ^{&} 1	100.0 9	158.60	2 ⁺	(E2)			
545.3	0 ⁺	386.8 ^c	43 ^c 4	158.60	2 ⁺	E2		0.0439	Mult.: from conversion-electron and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
		545.5 ^c	^c	0.0	0 ⁺	E0			
690.9	2 ⁺	145.8 ^c	7.8 ^c 3	545.3	0 ⁺				
		256.2	30 7	435.00	4 ⁺				
		532.4 ^c 2	100 ^c 11	158.60	2 ⁺	E0+E2+M1	-10 +3-5		Mult.: from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
777.63	6 ⁺	342.8 ^a 2	100 1	435.00	4 ⁺	(E2)			
846.2	2 ⁺	687.9 ^c	12 ^c 2	158.60	2 ⁺	E0+E2+M1	8 3		Mult., δ : from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
		846.4 ^c	60 ^c 7	0.0	0 ⁺				
989.4	4 ⁺	298.4 ^c	100 ^c 11	690.9	2 ⁺				
		554.5 ^c 5	93 ^c 9	435.00	4 ⁺	E0+E2+M1	-2.8 +7-12		Mult., δ : from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
		830.9	29 7	158.60	2 ⁺				
1054.0	3 ⁺	618.9 ^c	7 ^c 2	435.00	4 ⁺				
		895.6 ^c 4	25 ^c 3	158.60	2 ⁺	E2+M1	8 +5-2	0.00641	Mult., δ : from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
1171.93	8 ⁺	394.4 ^{&} 1	100.0 13	777.63	6 ⁺	(E2)			Ratio(DCO)=1.09 7.
1240.0		805.0 [#] 5	100 [#] 33	435.00	4 ⁺				
1254.1	4 ⁺	819.1 ^c	100 ^c 30	435.00	4 ⁺				
		1095.6 ^c	43 ^c 9	158.60	2 ⁺				
1417.6		1259.0 [#] 5	100 [#] 35	158.60	2 ⁺				
1420.1	(3 ⁻)	574.2 ^c	4.9 ^c 14	846.2	2 ⁺				
		1261.5 ^c 5	12 ^c 4	158.60	2 ⁺	E1(+M2)	+0.7 +3-2	0.0059 24	Mult., δ : from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
1424.9	6 ⁺	435.5 ^c	17 ^c 3	989.4	4 ⁺	E2		0.0321	Mult.: from conversion-electron data in ¹⁷⁴ Ir ε decay (1994Ki01).
		647.6 ^c	36 ^c 4	777.63	6 ⁺	E0+E2(+M1)	≤-3		Mult., δ : from conversion-electron data and $\gamma\gamma(\theta)$ in ¹⁷⁴ Ir ε decay (1994Ki01).
		989.8	27 4	435.00	4 ⁺				
1453.28	5 ⁺	675.1 ^c	45 ^c 15	777.63	6 ⁺				
		1018.2 ^b 2	100 10	435.00	4 ⁺				
1549.75	4 ⁻	495.1 ^c	24 ^c 7	1054.0	3 ⁺				
		559.7 ^c	12 ^c 2	989.4	4 ⁺				
		1114.7 ^{&} 3	100 7	435.00	4 ⁺				

Adopted Levels, Gammas (continued)

$\gamma(^{174}\text{Os})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. $^{\dagger@}$	$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. $^{\dagger@}$
1596.45	5 ⁽⁻⁾	606.7 ^c	17 ^c 4	989.4	4 ⁺		3389.1	14 ⁻	482.4 ^{&} 2	100 4	2906.7	12 ⁻	(E2)
		818.6 ^a 2	100 7	777.63	6 ⁺		3577.6	15 ⁻	503.5 ^a 2	100 5	3074.1	13 ⁻	(E2)
		1161.0 [#] 5	4 [#] 2	435.00	4 ⁺		3663.5	(15)	500.2 [#] 2	100 [#] 8	3163.3	(13)	
1617.5	10 ⁺	445.7 ^a 2	100.0 12	1171.93	8 ⁺	(E2)	3861.8	18 ⁺	622.0 ^a 2	100 3	3239.8	16 ⁺	(E2)
1790.37	6 ⁽⁻⁾	193.8 ^{bcd} 2	10 ^{cd} 2	1596.45	5 ⁽⁻⁾		3924.9	16 ⁽⁻⁾	535.8 ^a 2	≈100	3389.1	14 ⁻	(E2)
		240.6 ^{acd} 2	47 ^{cd} 7	1549.75	4 ⁻		4114.7	17 ⁻	537.1 ^a 2	≈100	3577.6	15 ⁻	(E2)
		337.0 ^{bc} 2	31 ^c 5	1453.28	5 ⁺		4225.5	(17)	562.0 [#] 5	≈100 [#]	3663.5	(15)	
		1012.6 ^{&c} 3	100 ^c 7	777.63	6 ⁺		4505.6	18 ⁻	580.7 ^b 2	100 5	3924.9	16 ⁽⁻⁾	
1860.51	7 ⁽⁻⁾	263.9 ^{acd} 2	21 ^{cd} 3	1596.45	5 ⁽⁻⁾		4524.9	20 ⁺	663.1 ^a 2	100 2	3861.8	18 ⁺	(E2)
		688.5 ^{ac} 2	100 ^c 5	1171.93	8 ⁺	D	4676.9	19 ⁻	562.2 ^a 2	100 5	4114.7	17 ⁻	(E2)
		1083.4 ^c 5	10 ^c 3	777.63	6 ⁺		4825.3	(19)	599.8 4	100 3	4225.5	(17)	
2102.8	8 ⁻	312.1 ^a 2	100.0 24	1790.37	6 ⁽⁻⁾	(E2)	5112.1	20 ⁻	606.5 ^b 2	100 4	4505.6	18 ⁻	
		932.6 5	9.8 16	1171.93	8 ⁺		5233.0	22 ⁺	708.1 ^{&} 3	100 3	4524.9	20 ⁺	(E2)
2113.8	12 ⁺	496.3 ^{&} 1	100.0 25	1617.5	10 ⁺	(E2)	5262.1	21 ⁻	585.2 ^{&} 3	100 18	4676.9	19 ⁻	(E2)
2205.66	9 ⁻	345.1 ^{&} 1	100 5	1860.51	7 ⁽⁻⁾	(E2)	5430.3	(21)	605.0		4825.3	(19)	
		588.3 ^{&} 2	27 3	1617.5	10 ⁺		5741.1	22 ⁻	629.0 5	100 8	5112.1	20 ⁻	
		1033.7 ^b 2	12.4 12	1171.93	8 ⁺		5870.1	23 ⁻	608.0 [#] 5	100 [#] 4	5262.1	21 ⁻	
2271.9		1100.0 [#] 5	100 [#] 33	1171.93	8 ⁺		5987.1	24 ⁺	754.0 ^b 5	100 3	5233.0	22 ⁺	
2410.1	(9)	260.7 [#] 2	50 [#] 11	2149.4?			6060.7	(23)	630.4 4	100 8	5430.3	(21)	
		792.6 ^b 2	100 20	1617.5	10 ⁺		6428.0	24 ⁻	686.9 4	100 5	5741.1	22 ⁻	
		1238.3 ^b 2	80 7	1171.93	8 ⁺		6512.1	25 ⁻	642.0 [#] 5	≈100 [#]	5870.1	23 ⁻	
2476.7	10 ⁽⁻⁾	373.9 ^a 2	100 2	2102.8	8 ⁻	(E2)	6760.7?	(25)	699.9 5	100 7	6060.7	(23)	
2613.8	11 ⁻	408.1 ^{&} 1	100 2	2205.66	9 ⁻	(E2)	6786.1	26 ⁺	799.0 ^b 5	100 7	5987.1	24 ⁺	
2622.5		1005.0 [#] 5	100 [#] 33	1617.5	10 ⁺		7190.0	26 ⁻	762.0 5	100 12	6428.0	24 ⁻	
2656.3	14 ⁺	542.5 ^a 2	100.0 18	2113.8	12 ⁺	(E2)	7199.0	27 ⁻	686.9 4	<100	6512.1	25 ⁻	
2706.5		1089.0 [#] 5	100 [#] 33	1617.5	10 ⁺		7628.4	28 ⁺	842.3 5	100 7	6786.1	26 ⁺	
2749.9	(11)	339.9 ^b 2	100 17	2410.1	(9)		7943.4	29 ⁻	744.4 4	100 4	7199.0	27 ⁻	
		1132.3 ^b 2	46 4	1617.5	10 ⁺		8018.8	28 ⁻	828.8 5	100 18	7190.0	26 ⁻	
2905.8		792.0 [#] 5	100 [#] 46	2113.8	12 ⁺		8511.6	30 ⁺	883.2 5	100 13	7628.4	28 ⁺	
2906.7	12 ⁻	430.0 ^a 2	100 7	2476.7	10 ⁽⁻⁾	(E2)	8749.7	31 ⁻	806.3 5	100 12	7943.4	29 ⁻	
3074.1	13 ⁻	460.3 ^{&} 1	100 3	2613.8	11 ⁻	(E2)	9429.7	32 ⁺	918.1 5	100 20	8511.6	30 ⁺	
3163.3	(13)	413.4 [#] 2	100 [#] 11	2749.9	(11)		9618.3	33 ⁻	868.6 5	100 18	8749.7	31 ⁻	
3239.8	16 ⁺	583.5 ^a 2	100 8	2656.3	14 ⁺	(E2)	10545.5?	(35 ⁻)	927.2 5	100 11	9618.3	33 ⁻	

Adopted Levels, Gammas (continued)

$\gamma(^{174}\text{Os})$ (continued)

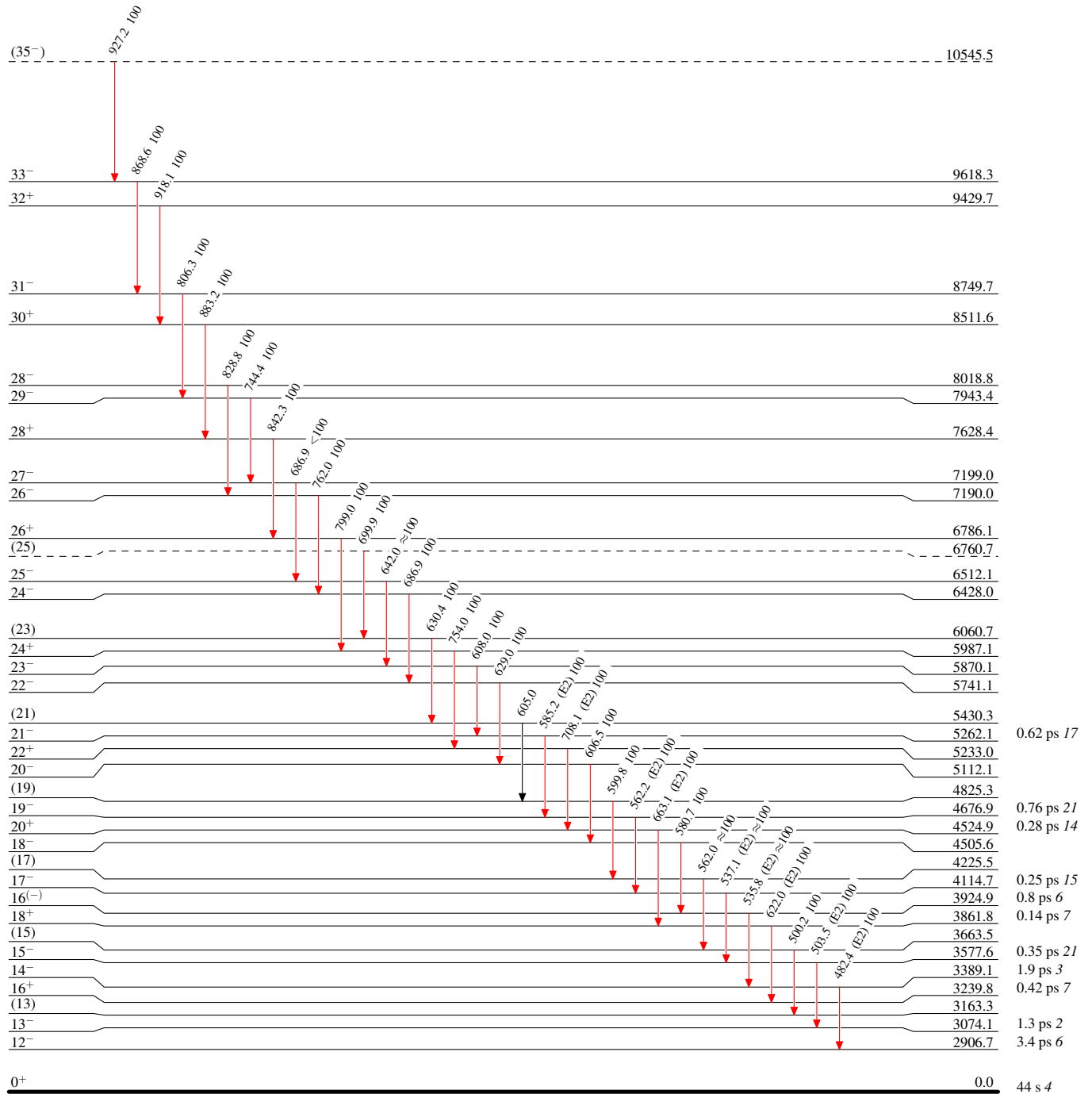
- [†] From $\gamma(\theta)$ in $^{150}\text{Sm}(^{28}\text{Si},4n\gamma)$, $(^{29}\text{Si},5n\gamma)$, and $^{146}\text{Nd}(^{32}\text{S}, 4n\gamma)$. Stretched-quadrupole transitions are assigned by the evaluator as E2, based on RUL.
- [‡] From [1992Hi09](#), except as noted.
- [#] From [1990Fa02](#).
- [@] From $\gamma(\theta)$. Quadrupole transitions are assumed to be stretched E2 ([1990Fa02](#),[1992Hi09](#)).
- [&] Weighted averaged values from [1992Hi09](#), [1990Fa02](#) and [1987Ga12](#).
- ^a Weighted averaged values from [1990Fa02](#) and [1987Ga12](#).
- ^b Weighted averaged values from [1990Fa02](#) and [1992Hi09](#).
- ^c From ^{174}Ir ε decay.
- ^d Contaminated in $^{146}\text{Nd}(^{32}\text{S},4n\gamma)$.
- ^e 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.

Adopted Levels, Gammas**Level Scheme**

Intensities: Type not specified

Legend

-  $I_\gamma < 2\% \times I_\gamma^{\max}$
 $I_\gamma < 10\% \times I_\gamma^{\max}$
 $I_\gamma > 10\% \times I_\gamma^{\max}$

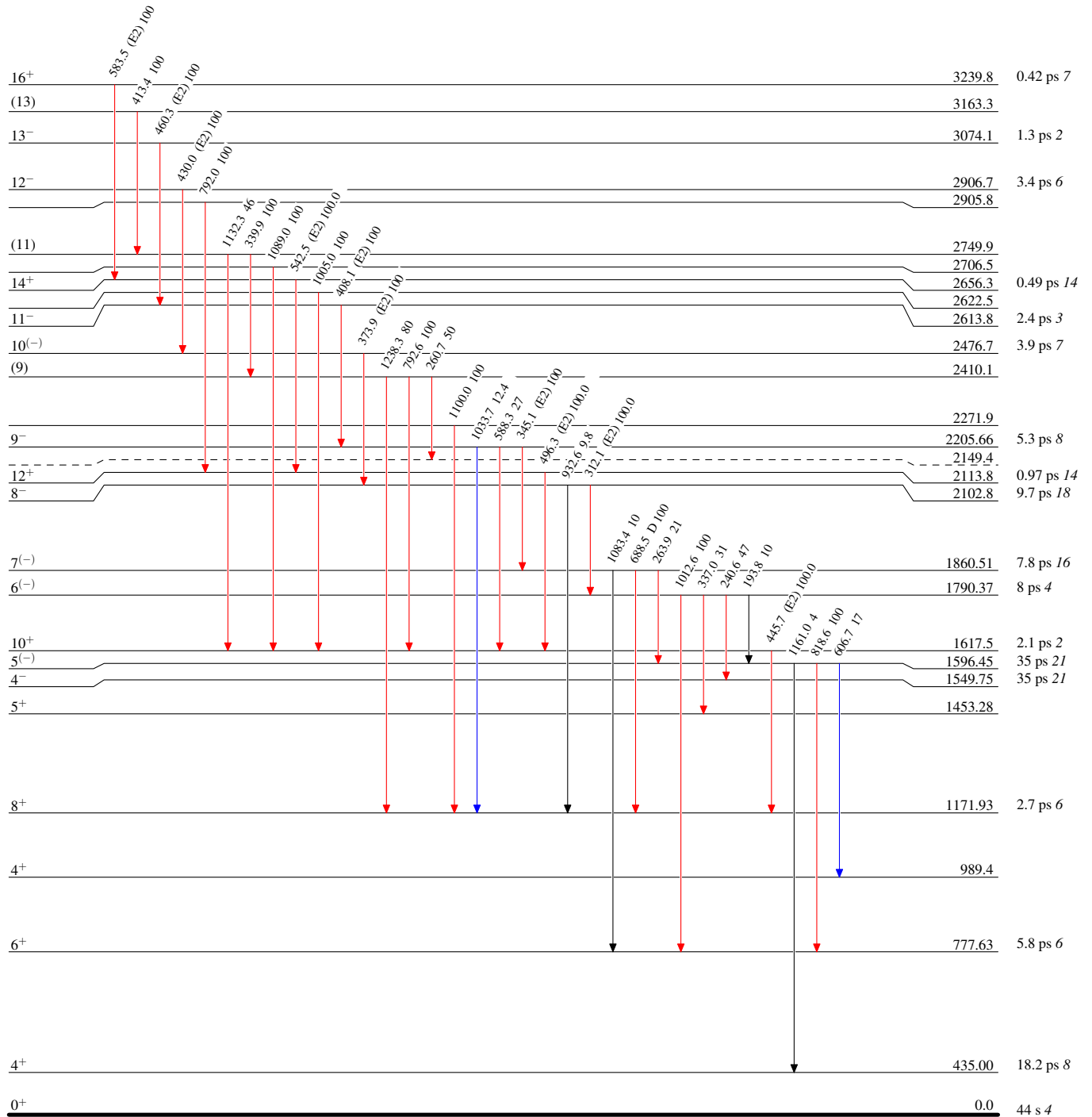


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified

Legend

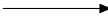
- $I_\gamma < 2\% \times I_\gamma^{\max}$
 —→ $I_\gamma < 10\% \times I_\gamma^{\max}$
 —→ $I_\gamma > 10\% \times I_\gamma^{\max}$

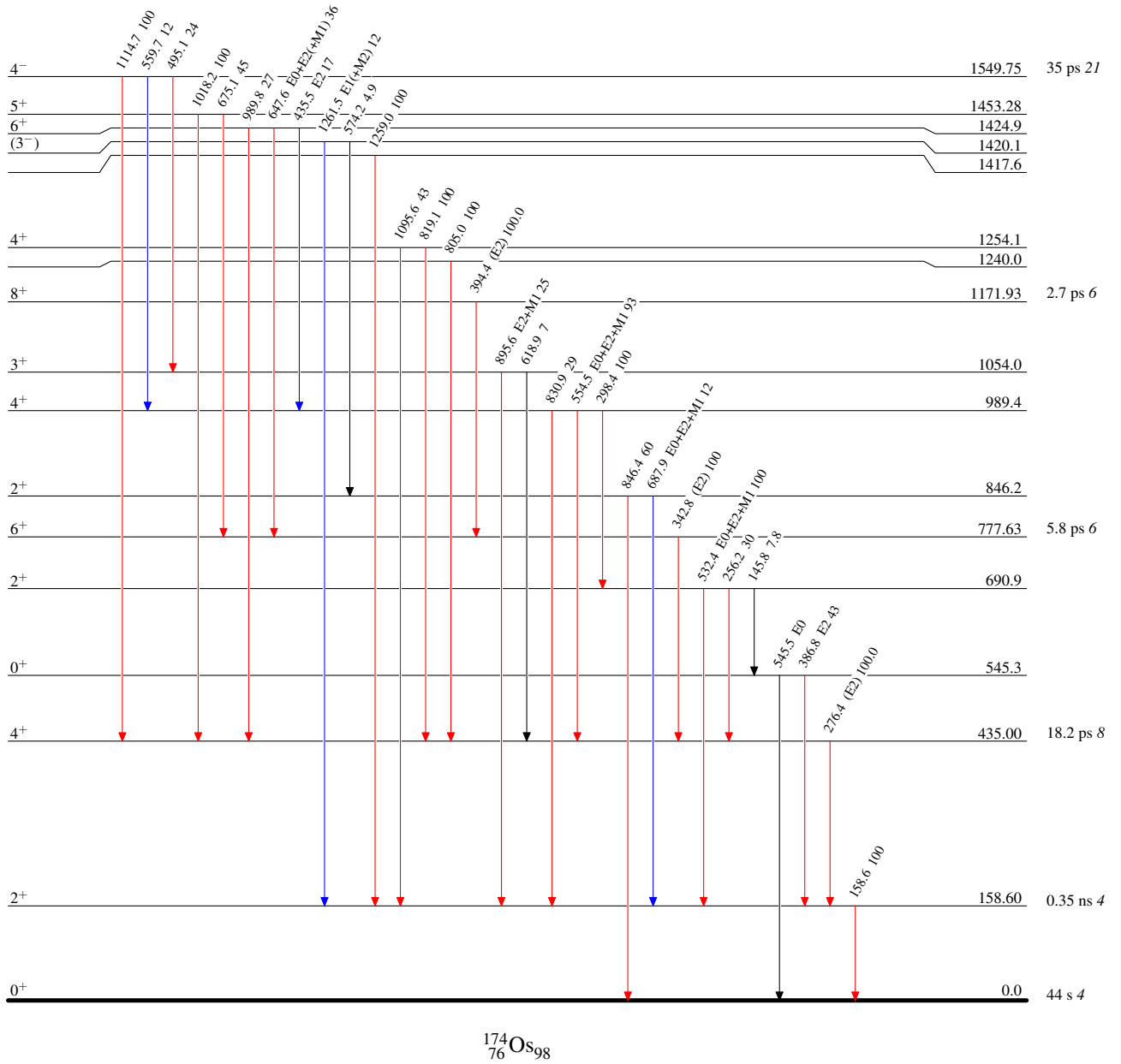


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified

Legend

-  $I_\gamma < 2\% \times I_\gamma^{\max}$
 $I_\gamma < 10\% \times I_\gamma^{\max}$
 $I_\gamma > 10\% \times I_\gamma^{\max}$



Adopted Levels, Gammas