^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 143, 1 (2017)	31-Mar-2017

Parent: ^{193}Os: E=0.0; $J^\pi=3/2^-$; $T_{1/2}$=29.830 h *18*; Q(β^-)=1141.9 *24*; %β^- decay=100.0

Others: 2005Za15,2008ZaZY,2007ZaZZ,1972De67,1971Bb09,1968Av01,1968Av02, 1968Pl03,1968Ra24,1967Ag06,1967Pe03,1960Fe03,1958Du76,1954De04,1953Co13.

Other contributing references are:

γ: 1971Lu08, 1970Ra37.

ce: 1970Ba56, 1969Co08.

$\gamma\gamma$(t), $\beta\gamma$(t), B(ce)(t): 1973Il02, 1972Be85, 1969Ba28, 1969Li13, 1969Va36, 1968Av02.

$\gamma\gamma(\theta$,H,T): 1985Be03.

1972Pr04: Measured Eγ, Iγ, E(ce), I(ce), $\gamma\gamma$-coin. Deduced excited level spin and parity, multipolarities, mixing ratios.

2012Kr05: Measured Eγ, Iγ, half-life using HPGe detector. Results are based on the average of three different samples each counted for at least 2 half-lives.

2002Ma18: Measured absolute γ-ray emission (intensity) probabilities in a $4\pi\beta\gamma$ coincidence experiment.

2005Za15: Measured Eγ, Iγ, $\gamma\gamma$-coin using planer detector array in coincidence mode (within 200 ns). Deduced excited levels.

1970Be06: 98.7% enriched ^{192}Os metal powder irradiated for approximately one hour with a neutron flux density of 2×10^{14}. Measured Eγ, Iγ, ce.

1969Pr02, 1958Na15: Measured γ, ce, β, $\gamma\gamma$, $\beta\gamma$, (ce)(ce)(t).

1984Gh01, 1973Kr05: Measured $\gamma\gamma(\theta)$, $\gamma(\theta$,H,T).

The decay scheme shown is from 1972Pr04 and 2005Za15.

Sum of decay energies of this dataset is 1140 keV *35* cf. 1142 keV *2* from ^{28}Ne β^- decay Q(g.s.) and decay branching.

^{193}Ir Levels

E(level)†	J^π‡	$T_{1/2}$#	Comments
0.0	$3/2^+$	stable	
73.037 *6*	$1/2^+$	6.09 ns *15*	$T_{1/2}$: weighted average of 6.3 ns *2* B(ce)(t) (1969Li13), 6.34 ns *16* $\gamma\gamma$(t) (1969Ba28), 5.90 ns *11* $\gamma\gamma$(t) (1972Be85,1973Il02), with increased uncertainty (discrepant data set).
80.234 *7*	$11/2^-$	10.53‡ d *4*	
138.946 *7*	$5/2^+$	80 ps *5*	$T_{1/2}$: Weighted average of 75 ps *10* (ce)(ce)(t) (1970Be06), 77 ps *17* $\gamma\gamma$(t) (1969Ba28), 74 ps *11* B(ce)(t) (1969Li13), 88 ps *9* B(ce)(t) (1968Av02). Other: 1960Fe03. Adopted value 69.7 ps *10* from recoil-distance method in Coulomb excitation (2000Be07).
180.070 *5*	$3/2^+$	59 ps *7*	$T_{1/2}$: weighted average of 55 ps *+8−15* (ce)(ce)(t) (1970Be06), 46 ps *15* $\gamma\gamma$(t) (1969Ba28), 66 ps *10* B(ce)(t) (1969Li13); other: <35 ps (1968Av02). Adopted value 43 ps *16*.
299.381 *9*	$7/2^-$	0.19 ns *3*	$T_{1/2}$: from (ce)(ce)(t) (1970Ba56).
357.764 *10*	$7/2^+$	18.7‡ ps *7*	
361.858 *6*	$5/2^+$	36 ps *7*	$T_{1/2}$: from B(ce)(t) (1969Va36). Others: 1968Av02, 1973Il02. Adopted value 31 ps *5*.
460.552 *5*	$3/2^+$	17 ps *4*	$T_{1/2}$: weighted average of 19 ps *5* (1968Av02), 15 ps *6* (1969Va36,1969Li13) B(ce)(t); other: 1973Il02. Adopted value 13.2 ps *10*.
516.585 *24*	$(7/2)^+$		
557.396 *6*	$(1/2)^+$	34 ps *8*	$T_{1/2}$: from B(ce)(t) (1969Va36); others: 1969Li13, 1968Av02, 1973Il02.
559.293 *7*	$5/2^+$	1.08‡ ps *16*	$T_{1/2}$: <76 ps b(ce)(t) (1969Va36); others: 1968Av02, 1969Li13, 1973Il02.
563.429 *16*			
598.212 *8*	$3/2^-$	2.8‡ ps *+28−9*	
621.02 *4*	$(7/2)^+$		
695.142 *7*	$5/2^+$		
712.197 *5*	$3/2^+$	15 ps *14*	$T_{1/2}$: from B(ce)(t) (1969Va36); other: 1968Av02.
740.348 *10*	$5/2^-$		
806.96@ *6*	$(5/2)^+$		

Continued on next page (footnotes at end of table)

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

^{193}Ir Levels (continued)

E(level)†	Jπ‡	E(level)†	E(level)†	E(level)†	Jπ‡
848.905 *11*	5/2+	879.50 *17*	890.40 *7*	964.41 *3*	1/2+
874.279 *12*	3/2+,5/2+	882.18 *7*	959.72 *4*	1077.81 *19*	(3/2−,5/2−)

† From least-squares fit to γ-ray energies, assuming ΔE=0.5 keV for missing uncertainties. Poor fit (5 to 6 std. dev.) for 181.38γ from 740 keV and 282.34γ, 418.31γ from 879 keV levels. Uncertainty tripled for least-squares fit − yet later two γ-transitions fit with 3 to 4 std. dev. χ^2=2.3 and $\chi^2_{critical}$=1.5.

‡ From Adopted Levels.

Best values from β^-decay unless otherwise noted; adopted values are given under Comments when different.

@ Level proposed by the evaluator: γ 667.7 in ^{193}Os decay agrees with γ 667.97 in (n,γ) and (d,nγ), and γ 668.04 in (n,n′γ) from 860.9 level.

β^- radiations

β^- feedings are from intensity imbalance at each level.

Others: Eβ: 1968Pl03, 1967Ag06, 1958Du76, 1954De04; βγ: 1969Pr02, 1968Pl03, 1967Ag06, 1960Fe03, 1958Du76.

E(decay)	E(level)	Iβ−†	Log *ft*	Comments
(64.1 *24*)	1077.81	0.0018 *5*	7.92 *13*	av Eβ=16.44 *64*
(177.5 *24*)	964.41	0.0033 *2*	9.02 *4*	av Eβ=47.73 *72*
(267.6 *24*)	874.279	0.033 *2*	8.58 *3*	av Eβ=74.33 *73*
(293.0 *24*)	848.905	0.0079 *8*	9.33 *5*	av Eβ=82.09 *74*
(401.6 *24*)	740.348	0.32 *1*	8.17 *2*	av Eβ=116.43 *78*
(429.7 *24*)	712.197	0.513 *8*	8.06 *1*	av Eβ=125.63 *79* L=0 (1984Gh01,1973Kr05); L=1 (1985Be03).
(446.8 *24*)	695.142	0.095 *3*	8.85 *2*	av Eβ=131.25 *80*
(543.7 *24*)	598.212	<0.02	>9.8	av Eβ=163.99 *83* L=1 (1985Be03).
(582.6 *24*)	559.293	0.72 *1*	8.35 *1*	av Eβ=177.45 *84* Eβ, Iβ: see data with 557 level. (L=2)/(L=1)=0.22 *13* (1984Gh01,1973Kr05).
(584.5 *24*)	557.396	2.33 *4*	7.85 *1*	av Eβ=178.11 *84* Eβ=510 *50*, Iβ=6, includes group to 559 level (FK analysis, 1958Na15).
(681.3 *24*)	460.552	7.74 *11*	7.55 *1*	av Eβ=212.40 *87* Eβ=670 *30*, Iβ=11 (FK analysis, 1958Na15). (L=0)/(L=1)=0.45 *5* (1984Gh01,1973Kr05); (L=0)/(L=1)=0.40 *15* (1985Be03).
(780.0 *24*)	361.858	0.72 *2*	8.79 *1*	av Eβ=248.36 *89* (L=2)/(L=1)=0.18 *14* (1984Gh01); L=1 (1985Be03).
(784.1 *24*)	357.764	0.013 *4*	10.88[1u] *14*	av Eβ=255.72 *84* No β^-group seen in FK analysis (1958Na15).
(842.5 *24*)	299.381	0.018 *8*	10.50 *20*	av Eβ=271.53 *90* L=1 (1985Be03).
(961.8 *24*)	180.070	1.5 *2*	8.79 *6*	av Eβ=316.80 *92* Eβ=850 *30*, Iβ=10 (FK analysis, 1958Na15). L=0 (1984Gh01).
(1003.0 *24*)	138.946	10.6 *2*	8.00 *1*	av Eβ=332.61 *93* Iβ=10 (FK analysis with Eβ=993, 1958Na15). (L=2)/(L=1)=0.14 *12* (1984Gh01), L=1 (1985Be03).
(1068.9 *24*)	73.037	17 *3*	7.90 *8*	av Eβ=358.23 *94* Iβ=21 (FK analysis with Eβ=1059, 1958Na15).
(1141.9 *24*)	0.0	59 *3*	7.46 *2*	av Eβ=386.96 *95*

Continued on next page (footnotes at end of table)

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

β^- radiations (continued)

E(decay)	E(level)	Comments
		E(decay): 1132 *5* (1958Na15). Others: 1130 *15* (1968Pl03), 1040 *30* (1967Ag06). Iβ^-: 42 (FK analysis, 1958Na15). (L=2)/(L=1)=0.14 *9* (1985Be03).

† Absolute intensity per 100 decays.

$\gamma(^{193}Ir)$

Iγ normalization: %Iγ(460γ)=3.88 *5*. 2002Ma18 measured absolute intensity in a 4πβγ coincidence experiment. The adopted value is the unweighted average of the four runs presented in 2002Ma18 instead of that quoted by the authors, which is the weighted average of discrepant data. Others: 4.0 *2* (1969Pr02, from Iβ and Iγ measured in singles and βγ measurements) and 3.9 *2* (1958Na15, from comparison of Iγ/Iβ in ^{193}Os and in ^{198}Au).

Experimental Ice from 1972Pr04, 1970Be06, 1970Ba56, and 1969Co08. Other: 1968Pl03 (not included in the evaluation; Ice uncertainties were not reported).

* I(K x ray), relative to Iγ=100 for 460.5γ (1972Pr04).

R: From 2012Kr05.

	E(X-ray)	I(X-ray) *
Ir $K\alpha_2$ x ray	63.28 5	98 9
Ir $K\alpha_1$ x ray	64.90 5	160 16
Ir $K\beta_1'$ x ray	73.58 10	33 5
Ir $K\beta_2'$ x ray	75.63 5	13 2

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	$I_{(\gamma+ce)}$[h]	Comments
41.18 *7*		180.070	3/2$^+$	138.946	5/2$^+$	[M1,E2]		1.5×10^2 *13*	1.9 *5*	ce(L)/(γ+ce)=0.7 *5*; ce(M)/(γ+ce)=0.19 *22* ce(N)/(γ+ce)=0.05 *6*; ce(O)/(γ+ce)=0.007 *9*; ce(P)/(γ+ce)=3.E−5 *4* α(L)=1.1×10^2 *10*; α(M)=3.E1 3 α(N)=7 *6*; α(O)=1.0 *10*; α(P)=0.005 *4* E_γ: From E(ce) measurements (1970Be06). I_γ: Iγ<0.01 estimated from ce(L1)<0.003 (1970Be06). $I_{(\gamma+ce)}$: Deduced from γγ measurements; γ not seen by 1972Pr04.
[x]61.564 *6*										E_γ: From 2005Za15, propose tentitive placement from 138.948 keV level. However, γ ray off by about 3 keV to final level. Evaluator list as unplaced.
65.87[i] *6*	0.06	138.946	5/2$^+$	73.037	1/2$^+$					E_γ: From 2005Za15. Other: 65.87 keV *6* (1970Be06). In 1970Be06 this γ-ray placed from 138.949 keV level, however, in 1972Pr04 a comparable transition energy listed as 64.90 keV *5* identified as $K_{\alpha1}$ line. Evaluator mark as uncertain placement and not adopted. 2005Za15 also identified as tentative placement.
73.029[&] *15*	79 *9*	73.037	1/2$^+$	0.0	3/2$^+$	M1+E2	−0.558 *5*	6.10 *10*		I_γ: From 1970Be06. Iγ estimated from I(ce(L3))=0.8 *2*. α(L)=4.63 *8*; α(M)=1.148 *19* α(N)=0.279 *5*; α(O)=0.0446 *7*; α(P)=0.001240 *18* E_γ: Weighted average of 73.012 *7* (1972Pr04), 73.10 *4*

$^{193}_{77}Ir_{116}$-4

$\gamma(^{193}\text{Ir})$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	$I_{(\gamma+ce)}$[h]	Comments
										(1970Be06), 73.044 *3* (1971Lu08), 72.951 *46* (2012Kr05). I_γ: Weighted average of 82 *12* (1972Pr04) and 74 *14* (2012Kr05). Mult.,δ: α(L1)exp=1.11 *16* (1972Pr04); L1:L2:L3=72.7 *14*: 105 *3*: 100 *3* (1972Pr04) Other ce measurements (1968Pl03,1969Co08,1970Be06) agree closely with those of 1972Pr04. δ from adopted gammas, Other: δ=0.56 *4* from conversion electron data, see δ footnote. Calculated circular polarization of γ (1988Fe11).
(80.234 *7*)		80.234	$11/2^-$	0.0	$3/2^+$	M4		2.11×10^4	8.8 *7*	ce(N)/(γ+ce)=0.0610 *12*; ce(O)/(γ+ce)=0.00928 *19*; ce(P)/(γ+ce)=0.000169 *4* α(K)=103.5 *15*; α(L)=1.451×10^4 *21*; α(M)=5.03×10^3 *7* α(N)=1289 *18*; α(O)=196 *3*; α(P)=3.57 *5* ce(K)/(γ+ce)=0.00490 *10*; ce(L)/(γ+ce)=0.687 *8*; ce(M)/(γ+ce)=0.238 *5* E_γ: From Adopted Gammas. Other: 80.19 (1972Pr04). Mult.: From Adopted Gammas. $I_{(\gamma+ce)}$: Deduced from intensity balance at 80.2 level.
96.815[#] *15*	2.42[#] *5*	557.396	$(1/2)^+$	460.552	$3/2^+$	M1+E2	0.171 *19*	6.68		α(K)=5.40 *9*; α(L)=0.982 *21*; α(M)=0.229 *6* α(N)=0.0562 *13*; α(O)=0.00980 *21*; α(P)=0.000672 *11* E_γ: Others: 96.82 *3* (1972Pr04), 96.90 *5* (1970Be06). I_γ: Other: 2.5 *2* (1972Pr04).
96.969[@] *15*	0.009[@] *2*	695.142	$5/2^+$	598.212	$3/2^-$					
98.681[#] *10*	0.423[#] *10*	460.552	$3/2^+$	361.858	$5/2^+$	(M1)		6.36		α(K)=5.24 *8*; α(L)=0.863 *12*; α(M)=0.199 *3* α(N)=0.0489 *7*; α(O)=0.00866 *13*; α(P)=0.000652 *10* E_γ: Others: 98.70 *8* (1972Pr04), 98.77 *6* (1970Be06). I_γ: Other: 0.42 *6* (1972Pr04).
107.07[&] *7*	14.4 *8*	180.070	$3/2^+$	73.037	$1/2^+$	M1+E2	+0.164 *8*	4.99		α(K)=4.06 *6*; α(L)=0.720 *11*; α(M)=0.167 *3* α(N)=0.0411 *7*; α(O)=0.00719 *11*; α(P)=0.000504 *8*

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									E_γ: 106.993 *10* (1972Pr04), 107.10 *4* (1970Be06), 107.16 *8* (1971Lu08), 107.019 *10* (2012Kr05). I_γ: Weighted ave. of 14.6 *3* (2012Kr05), 16.1 *8* (1972Pr04), 12.8 *7* (1970Be06). δ: Weighted average of 0.16 *1* (1984Gh01) and 0.171 *13* (2008ZaZY).
136[†]	0.011[†] *3*	695.142	5/2$^+$	559.293	5/2$^+$	[M1,E2]		2.0 *6*	α(K)=1.3 *9*; α(L)=0.53 *19*; α(M)=0.13 *6* α(N)=0.032 *13*; α(O)=0.0051 *17*; α(P)=0.00015 *11* I_γ: Iγ deduced from coincidence experiment does not agree with the relative branching measured in ^{191}Ir(nn,γ).
138.92[&] *3*	98.4 *13*	138.946	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.329 *12*	2.28	α(K)=1.82 *3*; α(L)=0.355 *6*; α(M)=0.0833 *13* α(N)=0.0204 *4*; α(O)=0.00353 *6*; α(P)=0.000224 *4* E_γ: 138.892 *7* (1972Pr04), 138.97 *4* (1970Be06), 138.947 *8* (1971Lu08), 138.932 *10* (2012Kr05). I_γ: Weighted ave. of 99.1 *19* (2012Kr05), 108 *5* (1972Pr04), 100 *6* (1970Be06), 95.7 *21* (2002Ma18). Mult.: from L subshell ratios: L1:L2:L3=100.0 *21*: 23.9 *11*: 8.5 *4* (1972Pr04), also 100 *4*: 24.3 *25*: 10.4 *13* (1969Co08). α(L)exp=0.401 *20* (1972Pr04), α(L)exp=0.38 *3* (1970Be06), α(L)exp=0.42 *4* (1969Co08). δ: Weighted ave. of 0.353 *21* (1969Co08) and 0.316 *15* (1970Be06, 1972Pr04). '-' sign from 1973Kr05 (θ,H,T). Also listed in 1984Gh01.
142.135 *6*	1.72 *3*	740.348	5/2$^-$	598.212	3/2$^-$	(M1)		2.24	α(K)=1.85 *3*; α(L)=0.303 *5*; α(M)=0.0698 *10* α(N)=0.01715 *24*; α(O)=0.00304 *5*; α(P)=0.000229 *4* E_γ: Weighted ave. of 142.130 *8* (1972Pr04), 142.26 *6* (1970Be06), 142.139 *10* (2012Kr05). I_γ: Others: 1.9 *2* (1972Pr04), 1.4 *2* (1970Be06). Mult.: α(K)exp=1.5 *3* (1972Pr04), α(K)exp=2.0 *4* (1970Be06).
154.751[@] *24*	0.0080[@] *21*	516.585	(7/2)$^+$	361.858	5/2$^+$				
154.800 *9*	0.692 *13*	712.197	3/2$^+$	557.396	(1/2)$^+$	M1+E2	+0.26 *3*	1.70 *3*	α(K)=1.38 *3*; α(L)=0.248 *5*; α(M)=0.0577 *11* α(N)=0.0142 *3*; α(O)=0.00247 *4*; α(P)=0.000170 *4* E_γ: Weighted ave. of 154.808 *10* (2012Kr05), 154.74 *3* (1972Pr04), 154.68 *10* (1970Be06). I_γ: Others: 0.76 *11* (1972Pr04), 0.63 *7* (1970Be06). Mult.,δ: α(K)exp=0.8 *3* (1972Pr04). δ=1.3 *6* from α(K)exp datum.
176.907[@] *16*	<0.029[@]	740.348	5/2$^-$	563.429					
180.061[#] *10*	4.31[#] *8*	180.070	3/2$^+$	0.0	3/2$^+$	M1+E2	−0.48 *2*	1.028 *17*	α(K)=0.814 *15*; α(L)=0.1646 *24*; α(M)=0.0388 *6*

$^{193}_{77}Ir_{116}$-6

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									α(N)=0.00951 *15*; α(O)=0.001633 *24*; α(P)=9.93×10^{-5} *19* E_γ: Others: 180.03 *3* (1972Pr04), 180.15 *6* (1970Be06). I_γ: Others: 4.6 *5* (1972Pr04), 4.5 *5* (1970Be06). Mult.: α(K)exp=1.00 *19*, α(L)exp=0.14 *3*, L1:L2:L3=100 *15*: 28 *9*: 15 *15* (1972Pr04). δ: Other: 0.63 *9* from conversion electrom data. See δ footnote.
181.38[@] *12*	0.004[@] *1*	740.348	5/2$^-$	559.293	5/2$^+$				E_γ,I_γ: Other: 181 (1972Pr04) seen in coincidence spectra only with Iγ=0.008 at the limit of detection.
181.785[#] *10*	4.63[#] *9*	361.858	5/2$^+$	180.070	3/2$^+$	M1+E2	+0.149 *11*	1.107	α(K)=0.910 *13*; α(L)=0.1519 *22*; α(M)=0.0351 *5* α(N)=0.00862 *13*; α(O)=0.001521 *22*; α(P)=0.0001120 *16* E_γ: Others: 181.81 *3* (1972Pr04), 181.89 *6* (1970Be06). I_γ: Others: 4.9 *5* (1972Pr04), 4.7 *5* (1970Be06). Mult.: α(K)exp=0.92 *11*, K/L=6.9 *14*, L1:L2:L3=100 *15*: 21 *10*: 15 *9* (1972Pr04). δ: δ=0.49 *7* from conversion electron data.
197.486[#] *24*	0.110[#] *6*	559.293	5/2$^+$	361.858	5/2$^+$	[M1,E2]		0.6 *3*	α(K)=0.5 *3*; α(L)=0.130 *11*; α(M)=0.031 *4* α(N)=0.0077 *10*; α(O)=0.00127 *8*; α(P)=5.E−5 *4* E_γ: Others: 197.4 *2* (1972Pr04), 197.486 *24* (2012Kr05). I_γ: Other: 0.12 *4* (1972Pr04).
201.52[#] *5*	0.097[#] *9*	559.293	5/2$^+$	357.764	7/2$^+$	[M1,E2]		0.6 *3*	α(K)=0.4 *3*; α(L)=0.121 *8*; α(M)=0.029 *4* α(N)=0.0071 *8*; α(O)=0.00118 *6*; α(P)=5.E−5 *4* E_γ,I_γ: Other: 201.5 *3*, 0.07 *4* (1972Pr04). δ: 0.02 *4* (2007ZaZZ).
219[†]	0.22[†] *5*	357.764	7/2$^+$	138.946	5/2$^+$	M1+E2	−0.280 *9*	0.637	α(K)=0.520 *8*; α(L)=0.0896 *13*; α(M)=0.0208 *3* α(N)=0.00510 *8*; α(O)=0.000895 *13*; α(P)=6.38×10^{-5} *10* Mult.,δ: from Adopted Gammas.
219.144[#] *10*	6.58[#] *11*	299.381	7/2$^-$	80.234	11/2$^-$	E2		0.254	α(K)=0.1343 *19*; α(L)=0.0906 *13*; α(M)=0.0229 *4* α(N)=0.00555 *8*; α(O)=0.000870 *13*; α(P)=1.374×10^{-5} *20* E_γ: Others: 219.13 *5* (1972Pr04), 219.18 *8* (1970Be06). I_γ: Others: 7.0 *5* (1972Pr04), 6.6 *6* (1970Be06). Mult.: α(K)exp=0.12 *3*, K/L=1.5 *4*, L1:L2:L3=<44: 100 *19*: 63 *11* (1972Pr04).
234.572[#] *10*	1.23[#] *3*	695.142	5/2$^+$	460.552	3/2$^+$	M1+E2	−0.36 *9*	0.511 *20*	α(K)=0.416 *20*; α(L)=0.0733 *11*; α(M)=0.01704 *24* α(N)=0.00418 *6*; α(O)=0.000732 *12*; α(P)=5.09×10^{-5} *25* E_γ: Others: 234.58 *6* (1972Pr04), 234.60 *12* (1970Be06). I_γ: Others: 1.30 *17* (1972Pr04), 1.2 *1* (1970Be06). δ: Weighted average of −0.20 *13* (nuclear orientation − 1973Kr05) and −0.41 *7* (2007ZaZZ).
236.31[@] *4*	0.017[@] *3*	598.212	3/2$^-$	361.858	5/2$^+$				
251.645[#] *10*	5.34[#] *7*	712.197	3/2$^+$	460.552	3/2$^+$	M1+E2	−0.11 *3*	0.451	α(K)=0.372 *6*; α(L)=0.0607 *9*; α(M)=0.01399 *20* α(N)=0.00344 *5*; α(O)=0.000608 *9*; α(P)=4.56×10^{-5} *7* E_γ: Others: 251.62 *4* (1972Pr04), 251.66 *8* (1970Be06).

$^{193}_{77}Ir_{116}$-7

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									I_γ: Others: 5.5 *4* (1972Pr04), 5.4 *4* (1970Be06). δ: Unweighted average of −0.132 *7* (2008ZaZY) and −0.079 *20* (1984Gh01) other: δ=0.45 *14* from conversion electron data, see δ footnote.
253.08[@] *8*	<0.043[@]	874.279	$3/2^+,5/2^+$	621.02	$(7/2)^+$				
263.02[@] *15*	0.0012[@] *7*	621.02	$(7/2)^+$	357.764	$7/2^+$				
263.997[@] *25*	0.016[@] *3*	563.429		299.381	$7/2^-$				
280.476 *9*	31.7 *2*	460.552	$3/2^+$	180.070	$3/2^+$	M1+E2	−0.049 *12*	0.337	α(K)=0.279 *4*; α(L)=0.0451 *7*; α(M)=0.01037 *15* α(N)=0.00255 *4*; α(O)=0.000452 *7*; α(P)=3.41×10^{-5} *5* E_γ: Weighted average of 280.482 *10* (2012Kr05), 280.43 *3* (1972Pr04) 280.50 *8* (1970Be06), and 280.457 *35* (1971Lu08). I_γ: From 2002Ma18. Others: 31.9 *3* (2012Kr05), 31.5 *16* (1972Pr04), 33.0 *17* (1970Be06). Mult.: α(K)exp=0.35 *3*, K/L=5.7 *3*, L1:L2:L3=100 *5*: 18: 4: <5 (1972Pr04); α(K)exp=0.27 *3*, K/L=5.6 *7* (1970Be06); δ: 0.18 *11* from conversion electron data. See δ footnote.
282.34[@] *9*	0.025[@] *3*	879.50		598.212	$3/2^-$				
283.97[@] *7*	0.028[@] *3*	882.18		598.212	$3/2^-$				
288.819[#] *10*	3.62[#] *4*	361.858	$5/2^+$	73.037	$1/2^+$	(E2)		0.1063	α(K)=0.0661 *10*; α(L)=0.0304 *5*; α(M)=0.00758 *11* α(N)=0.00184 *3*; α(O)=0.000294 *5*; α(P)=7.06×10^{-6} *10* E_γ: Others: 288.79 *5* (1972Pr04), 288.98 *15* (1970Be06). I_γ: Others: 3.6 *3* (1972Pr04), 4.0 *3* (1970Be06). Mult.: α(K)exp=0.087 *15* (1972Pr04), 0.077 *19* (1970Be06).
290[†]	0.012[†]	848.905	$5/2^+$	559.293	$5/2^+$	[M1,E2]		0.21 *11*	α(K)=0.16 *10*; α(L)=0.036 *6*; α(M)=0.0085 *10* α(N)=0.0021 *3*; α(O)=0.00035 *7*; α(P)=1.9×10^{-5} *13* I_γ: At detection limit.
292.19[@] *7*	0.0170[@] *24*	890.40		598.212	$3/2^-$				
298.831[#] *10*	4.79[#] *5*	598.212	$3/2^-$	299.381	$7/2^-$	(E2)		0.0959	α(K)=0.0607 *9*; α(L)=0.0267 *4*; α(M)=0.00666 *10* α(N)=0.001617 *23*; α(O)=0.000259 *4*; α(P)=6.51×10^{-6} *10* E_γ: Others: 298.83 *5* (1972Pr04), 298.71 *15* (1970Be06). I_γ: Others: 4.7 *4* (1972Pr04), 4.8 *3* (1970Be06).
314.93[@] *5*	0.050[@] *10*	874.279	$3/2^+,5/2^+$	559.293	$5/2^+$				
317[†]	0.026[†] *7*	874.279	$3/2^+,5/2^+$	557.396	$(1/2)^+$	[M1,E2]		0.16 *8*	α(K)=0.13 *8*; α(L)=0.027 *6*; α(M)=0.0064 *11* α(N)=0.0016 *3*; α(O)=0.00027 *6*; α(P)=1.5×10^{-5} *10*
321.616 *10*	32.1 *2*	460.552	$3/2^+$	138.946	$5/2^+$	M1+E2	+0.234 *10*	0.225	α(K)=0.185 *3*; α(L)=0.0305 *5*; α(M)=0.00702 *10* α(N)=0.001726 *25*; α(O)=0.000305 *5*; α(P)=2.26×10^{-5}

$^{193}_{77}Ir_{116}$-8

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									4 E_γ: From 2012Kr05. Others: 321.56 *3* (1972Pr04), 321.63 *10* (1970Be06), 321.627 *35* (1971Lu08). I_γ: Weighted ave. of 31.9 *3* (2012Kr05), 32.3 *16* (1972Pr04), 35.0 *20* (1970Be06), 32.2 *2* (2002Ma18). Mult.: α(K)exp=0.244 *18*, K/L=6.1 *9*, L1:L2:L3=100 *11*: 18 *8*: 14 *14* (1972Pr04); α(K)exp=0.182 *21*, K/L=6.4 *9* (1970Be06). δ: Other: +0.236 *16* (2008ZaZY).
333.24 *5*	0.065 *5*	695.142	$5/2^+$	361.858	$5/2^+$	(M1)		0.211	α(K)=0.1750 *25*; α(L)=0.0282 *4*; α(M)=0.00648 *9* α(N)=0.001592 *23*; α(O)=0.000282 *4*; α(P)=2.14×10^{-5} *3* E_γ: From 2012Kr05. Others: 333.3 *3* (1972Pr04), 333.0 *3* (1970Be06). I_γ: Weighted ave. of 0.067 *5* (2012Kr05), 0.07 *4* (1972Pr04), 0.04 *2* (1970Be06).
336.39[@] *15*	0.054[@] *10*	516.585	$(7/2)^+$	180.070	$3/2^+$				
337.30[#] *7*	0.017[#] *3*	695.142	$5/2^+$	357.764	$7/2^+$	[M1,E2]		0.14 *7*	α(K)=0.11 *7*; α(L)=0.022 *5*; α(M)=0.0053 *11* α(N)=0.0013 *3*; α(O)=0.00022 *6*; α(P)=1.3×10^{-5} *8* E_γ: Other: 337.7 *5* (1972Pr04). I_γ: Other: 0.03 *2* (1972Pr04).
350.343 *16*	0.141 *12*	712.197	$3/2^+$	361.858	$5/2^+$	[M1,E2]		0.12 *7*	α(K)=0.10 *6*; α(L)=0.020 *5*; α(M)=0.0047 *10* α(N)=0.00114 *25*; α(O)=0.00020 *5*; α(P)=1.2×10^{-5} *7* E_γ: From 2012Kr05. Others: 350.2 *2* (1972Pr04), 350.2 *3* (1970Be06). I_γ: Weighted ave. of 0.138 *4* (2012Kr05), 0.18 *6* (1972Pr04), 0.16 *5* (1970Be06).
354.25[@] *12*	0.0023[@] *13*	712.197	$3/2^+$	357.764	$7/2^+$				
357.761[#] *10*	0.233[#] *4*	357.764	$7/2^+$	0.0	$3/2^+$	E2		0.0571	α(K)=0.0388 *6*; α(L)=0.01389 *20*; α(M)=0.00342 *5* α(N)=0.000833 *12*; α(O)=0.0001349 *19*; α(P)=4.26×10^{-6} *6* E_γ: Others: 357.7 *2* (1972Pr04), 357.8 *3* (1970Be06). I_γ: Others: 0.25 *8* (1972Pr04), 0.30 *18* (1970Be06).
361.51[@] *3*	0.083[@] *7*	959.72		598.212	$3/2^-$				
361.858[#] *10*	7.30[#] *7*	361.858	$5/2^+$	0.0	$3/2^+$	M1+E2	−0.315 *19*	0.159 *3*	α(K)=0.1310 *21*; α(L)=0.0217 *4*; α(M)=0.00501 *8* α(N)=0.001230 *18*; α(O)=0.000217 *4*; α(P)=1.59×10^{-5} *3* E_γ: Others: 361.79 *5* (1972Pr04), 361.92 *12* (1970Be06). I_γ: others: 7.5 *6* (1972Pr04), 6.4 *4* (1970Be06). Mult.: α(K)exp=0.18 *3* (1972Pr04), 0.17 *3* (1970Be06). δ: Weighted average of −0.314 *27* (2008ZaZY), −0.33 *3* (1984Gh01), and −0.26 *7* (1985Be03).
377.340[#] *10*	1.67[#] *2*	557.396	$(1/2)^+$	180.070	$3/2^+$	(M1+E2)	1.0 *5*	0.10 *3*	α(K)=0.08 *3*; α(L)=0.016 *3*; α(M)=0.0037 *6* α(N)=0.00091 *14*; α(O)=0.00016 *3*; α(P)=1.0×10^{-5} *4* E_γ: Others: 377.31 *7* (1972Pr04), 377.60 *20* (1970Be06). I_γ: Others: 1.8 *2* (1972Pr04), 1.7 *2* (1970Be06).

$^{193}_{77}Ir_{116}$-9

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
377.41[@] *8*	0.016[@] *4*	516.585	(7/2)$^+$	138.946	5/2$^+$				
378.38[#] *10*	0.04[#] *1*	740.348	5/2$^-$	361.858	5/2$^+$	[E1]		0.01471	α(K)=0.01224 *18*; α(L)=0.00191 *3*; α(M)=0.000437 *7* α(N)=0.0001067 *15*; α(O)=1.85×10^{-5} *3*; α(P)=1.238×10^{-6} *18* E_γ,I_γ: Other: 378, 0.041 *10* (1972Pr04).
379.19[#] *3*	0.26[#] *1*	559.293	5/2$^+$	180.070	3/2$^+$	[M1,E2]		0.10 *5*	α(K)=0.08 *5*; α(L)=0.016 *5*; α(M)=0.0037 *9* α(N)=0.00090 *23*; α(O)=0.00015 *5*; α(P)=9.E−6 *6* E_γ: Others: 379.04 *15* (1972Pr04), 379.0 *5* (1970Be06). I_γ: Others: 0.35 *9* (1972Pr04), 0.20 *8* (1970Be06).
382.63[@] *15*	0.0017[@] *10*	740.348	5/2$^-$	357.764	7/2$^+$				
387.509 *10*	31.6 *2*	460.552	3/2$^+$	73.037	1/2$^+$	M1+E2	−0.24 *4*	0.136 *3*	α(K)=0.1122 *22*; α(L)=0.0183 *3*; α(M)=0.00421 *7* α(N)=0.001034 *17*; α(O)=0.000183 *3*; α(P)=1.36×10^{-5} *3* E_γ: From (2012Kr05). Others: 387.46 *4* (1972Pr04), 387.48 *12* (1970Be06), 387.509 *58* (1971Lu08). I_γ: Weighted ave. of 31.3 *3* (2012Kr05), 31.9 *16* (1972Pr04), 29.0 *20* (1970Be06), 31.8 *2* (2002Ma18). Mult.: α(K)exp=0.138 *10*, K/L=6.3 *9*, L1:L2:L3=100 *15*: 23 *10*: <11 (1972Pr04); α(K)exp=0.131 *17*, K/L=5.6 *10* (1970Be06). δ: δ=0.25 *10* from conversion electron data. See δ footnote.
413.730 *16*	0.105 *5*	874.279	3/2$^+$,5/2$^+$	460.552	3/2$^+$	(M1,E2)		0.08 *4*	α(K)=0.06 *4*; α(L)=0.012 *4*; α(M)=0.0028 *8* α(N)=0.00069 *20*; α(O)=0.00012 *4*; α(P)=7.E−6 *5* E_γ: Weighted average of 413.729 *16* (2012Kr05), 413.8 *2* (1972Pr04), and 414.0 *3* (1970Be06). I_γ: Others: 0.12 *4* (1972Pr04), 0.11 *3* (1970Be06).
418[†]	0.18[†] *4*	598.212	3/2$^-$	180.070	3/2$^+$	[E1]		0.01176	α(K)=0.00980 *14*; α(L)=0.001517 *22*; α(M)=0.000347 *5* α(N)=8.47×10^{-5} *12*; α(O)=1.470×10^{-5} *21*; α(P)=9.99×10^{-7} *14*
418.31[@] *7*	0.012[@] *7*	879.50		460.552	3/2$^+$				
418.431[#] *16*	1.34[#] *1*	557.396	(1/2)$^+$	138.946	5/2$^+$	[E2]		0.0373	α(K)=0.0266 *4*; α(L)=0.00814 *12*; α(M)=0.00199 *3* α(N)=0.000484 *7*; α(O)=7.94×10^{-5} *12*; α(P)=2.97×10^{-6} *5* E_γ: Others: 418.35 *8* (1972Pr04), 418.16 *20* (1970Be06). I_γ: Others: 1.38 *14* (1972Pr04), 1.6 *2* (1970Be06).
420.346[#] *10*	4.07[#] *4*	559.293	5/2$^+$	138.946	5/2$^+$	M1(+E2)	0.03 *4*	0.1136 *17*	α(K)=0.0941 *14*; α(L)=0.01504 *22*; α(M)=0.00346 *5* α(N)=0.000850 *12*; α(O)=0.0001506 *22*; α(P)=1.143×10^{-5} *17* E_γ: Others: 420.30 *5* (1972Pr04), 420.07 *20* (1970Be06). I_γ: Others: 4.2 *3* (1972Pr04), 3.7 *4* (1970Be06).
440.981 *18*	2.27 *12*	740.348	5/2$^-$	299.381	7/2$^-$	M1+E2	−0.37 *4*	0.0920 *21*	α(K)=0.0758 *18*; α(L)=0.01247 *23*; α(M)=0.00288 *6*

$^{193}_{77}Ir_{116}$-10

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									α(N)=0.000707 *13*; α(O)=0.0001247 *24*; α(P)=9.17×10^{-6} *22* E_γ: Weighted ave. of 440.986 *19* (2012Kr05), 440.95 *5* (1972Pr04), and 440.90 *20* (1970Be06). I_γ: Others: 2.32 *16* (1972Pr04), 2.2 *2* (1970Be06). Mult.: α(K)exp=0.085 *17* (1972Pr04), α(K)exp=0.09 *3* (1970Be06). δ: From 1973Kr05. Other: δ=0.19 *4* and 0.32 *10* from listed α(K)exp values, respectively.
449.16[@] *6*	0.007[@] *3*	806.96	(5/2)$^+$	357.764	7/2$^+$				
460.541 *10*	100.0 *5*	460.552	3/2$^+$	0.0	3/2$^+$	M1+E2	−0.64 *3*	0.0718 *16*	α(K)=0.0587 *13*; α(L)=0.01010 *18*; α(M)=0.00234 *4* α(N)=0.000575 *10*; α(O)=0.0001007 *19*; α(P)=7.06×10^{-6} *17* E_γ: Weighted average of 460.547 *10* (2012Kr05), 460.49 *3* (1972Pr04) 460.56 *12* (1970Be06), and 460.501 *65* (1971Lu08). I_γ: From 2002Ma18. Others: 100 *1* (2012Kr05), 100 *5* (1972Pr04), 100 *6* (1970Be06). δ: Others: −0.49 *2* (1985Be03) and −0.634 *17* (2008ZaZY).
482.06[@] *5*	0.022[@] *4*	621.02	(7/2)$^+$	138.946	5/2$^+$				
483.34[@] *7*	0.006[@] *2*	563.429		80.234	11/2$^-$				
484.359[#] *10*	4.33[#] *6*	557.396	(1/2)$^+$	73.037	1/2$^+$	(M1)		0.0782	α(K)=0.0648 *9*; α(L)=0.01031 *15*; α(M)=0.00237 *4* α(N)=0.000582 *9*; α(O)=0.0001033 *15*; α(P)=7.85×10^{-6} *11* E_γ: Others: 484.25 *5* (1972Pr04) and 484.22 *15* (1970Be06). I_γ: Others: 4.3 *3* (1972Pr04), 4.8 *5* (1970Be06).
486.255[#] *10*	0.271[#] *3*	559.293	5/2$^+$	73.037	1/2$^+$	[E2]		0.0254	α(K)=0.0188 *3*; α(L)=0.00504 *7*; α(M)=0.001218 *17* α(N)=0.000297 *5*; α(O)=4.93×10^{-5} *7*; α(P)=2.12×10^{-6} *3* E_γ,I_γ: Other: 486.11 *15*, 0.29 *14* (1972Pr04).
487.22[@] *11*	0.0053[@] *12*	848.905	5/2$^+$	361.858	5/2$^+$				
491.26[@] *8*	0.0045[@] *18*	848.905	5/2$^+$	357.764	7/2$^+$				
512.3[‡] *3*	0.04[‡] *2*	874.279	3/2$^+$,5/2$^+$	361.858	5/2$^+$	[M1,E2]		0.045 *23*	α(K)=0.036 *20*; α(L)=0.0066 *23*; α(M)=0.0015 *5* α(N)=0.00038 *13*; α(O)=6.6×10^{-5} *24*; α(P)=4.3×10^{-6} *25*
515.064[#] *10*	0.293[#] *4*	695.142	5/2$^+$	180.070	3/2$^+$	(M1,E2)		0.044 *23*	α(K)=0.036 *20*; α(L)=0.0065 *23*; α(M)=0.0015 *5* α(N)=0.00037 *13*; α(O)=6.5×10^{-5} *24*; α(P)=4.3×10^{-6} *24* E_γ: Others: 514.95 *10* (1972Pr04), 515.2 *2* (1970Be06). I_γ: Others: 0.28 *5* (1972Pr04), 0.40 *6* (1970Be06).
516.52[#] *4*	0.073[#] *2*	874.279	3/2$^+$,5/2$^+$	357.764	7/2$^+$	[M1,E2]		0.044 *22*	α(K)=0.036 *20*; α(L)=0.0064 *23*; α(M)=0.0015 *5*

$^{193}_{77}Ir_{116}$-11

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	δ[cdg]	α[f]	Comments
									α(N)=0.00037 *13*; α(O)=6.4×10^{-5} *23*; α(P)=4.2×10^{-6} *24* E_γ,I_γ: Other: 516.3 *4*, 0.06 *3* (1972Pr04).
[x]517.84[@] *4*	0.080[@] *10*								E_γ: 2005Za15 propose the placement from 598 keV level. However, if placed, this would be a 3/2$^-$ to 11/2$^-$ transition. Evaluator list it as unplaced.
525.190[#] *10*	0.41[#] *44*	598.212	3/2$^-$	73.037	1/2$^+$	[E1]		0.00717	α(K)=0.00599 *9*; α(L)=0.000911 *13*; α(M)=0.000208 *3* α(N)=5.08×10^{-5} *8*; α(O)=8.86×10^{-6} *13*; α(P)=6.20×10^{-7} *9* E_γ: Others: 524.98 *8* (1972Pr04), 525.3 *2* (1970Be06). I_γ: Others: 0.40 *4* (1972Pr04), 0.40 *6* (1970Be06).
532.126[#] *10*	2.14[#] *2*	712.197	3/2$^+$	180.070	3/2$^+$	M1+E2[e]	+0.48 *+32−16*	0.053 *9*	α(K)=0.044 *8*; α(L)=0.0073 *9*; α(M)=0.00167 *19* α(N)=0.00041 *5*; α(O)=7.2×10^{-5} *9*; α(P)=5.3×10^{-6} *9* E_γ: Others: 532.02 *5* (1972Pr04), 532.3 *2* (1970Be06). I_γ: Others: 2.10 *15* (1972Pr04), 2.2 *2* (1970Be06).
556[†]	0.08[†] *2*	695.142	5/2$^+$	138.946	5/2$^+$	(E2)		0.0184	α(K)=0.01399 *20*; α(L)=0.00337 *5*; α(M)=0.000808 *12* α(N)=0.000197 *3*; α(O)=3.30×10^{-5} *5*; α(P)=1.587×10^{-6} *23*
557.401[#a] *10*	33.7[#] *3*	557.396	(1/2)$^+$	0.0	3/2$^+$	(M1)		0.0541	α(K)=0.0449 *7*; α(L)=0.00712 *10*; α(M)=0.001633 *23* α(N)=0.000401 *6*; α(O)=7.12×10^{-5} *10*; α(P)=5.42×10^{-6} *8* E_γ: Others: 557.36 *8* (1972Pr04) and 557.41 *15* (1970Be06). I_γ: Others: 33 *3* (1972Pr04), 39.1 *50* (1970Be06).
559.289[#a] *10*	12.4[#] *1*	559.293	5/2$^+$	0.0	3/2$^+$	(M1)		0.0537	α(K)=0.0445 *7*; α(L)=0.00705 *10*; α(M)=0.001619 *23* α(N)=0.000398 *6*; α(O)=7.06×10^{-5} *10*; α(P)=5.38×10^{-6} *8* E_γ: Others: 559.26 *8* (1972Pr04), 559.22 *15* (1970Be06). I_γ: Others: 12.3 *12* (1972Pr04), 15.5 *20* (1970Be06).
560[†]	0.07[†] *2*	740.348	5/2$^-$	180.070	3/2$^+$	[E1]		0.00627	α(K)=0.00524 *8*; α(L)=0.000793 *12*; α(M)=0.000181 *3* α(N)=4.42×10^{-5} *7*; α(O)=7.73×10^{-6} *11*; α(P)=5.45×10^{-7} *8*
573.267[#] *10*	0.519[#] *5*	712.197	3/2$^+$	138.946	5/2$^+$	M1+E2[e]	+0.03 *2*	0.0503	α(K)=0.0417 *6*; α(L)=0.00661 *10*; α(M)=0.001516 *22* α(N)=0.000373 *6*; α(O)=6.61×10^{-5} *10*; α(P)=5.04×10^{-6} *7* E_γ: Others: 573.33 *10* (1972Pr04), 573.4 *2* (1970Be06). I_γ: Others: 0.49 *5* (1972Pr04), 0.54 *6* (1970Be06).
598.42 *7*	0.018 *6*	598.212	3/2$^-$	0.0	3/2$^+$	[E1]		0.00547	α(K)=0.00458 *7*; α(L)=0.000689 *10*; α(M)=0.0001571 *22* α(N)=3.84×10^{-5} *6*; α(O)=6.72×10^{-6} *10*; α(P)=4.77×10^{-7} *7*

$^{193}_{77}Ir_{116}$-12

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	α[f]	Comments
								E_γ: Weighted ave. of 598.438 *78* (2012Kr05). 598.1 *3* (1972Pr04), 598.6 *4* (1970Be06). I_γ: Others: 0.017 *8* (1972Pr04), 0.02 *1* (1970Be06).
601.89[@] *18*	0.0063[@] *9*	740.348	$5/2^-$	138.946	$5/2^+$			
620.93[@] *10*	0.018[@] *4*	621.02	$(7/2)^+$	0.0	$3/2^+$			
639.151[#] *10*	0.197[#] *2*	712.197	$3/2^+$	73.037	$1/2^+$	[M1,E2]	0.026 *13*	α(K)=0.021 *11*; α(L)=0.0036 *14*; α(M)=0.0008 *3* α(N)=0.00021 *8*; α(O)=3.6×10^{-5} *14*; α(P)=2.5×10^{-6} *13* E_γ: Others: 639.09 *10* (1972Pr04), 639.3 *2* (1970Be06). I_γ: Others: 0.19 *3* (1972Pr04), 0.21 *3* (1970Be06).
668.10 *10*	0.021 *3*	806.96	$(5/2)^+$	138.946	$5/2^+$			E_γ: Using the Limitation of relative statistical weight method of 668.147 *55* (2012Kr05), 668.09 *9* (2005Za15), 668.3 *3* (1972Pr04), and 667.0 *4* (1970Be06). I_γ: Using the Limitation of relative statistical Weight method of 0.026 *1* (2012Kr05), 0.016 *2* (2005Za15), 0.019 *9* (1972Pr04), and 0.03 *1* (1970Be06).
695.159[#] *14*	0.068[#] *2*	695.142	$5/2^+$	0.0	$3/2^+$	[M1,E2]	0.021 *10*	α(K)=0.017 *9*; α(L)=0.0029 *11*; α(M)=0.00067 *25* α(N)=0.00017 *6*; α(O)=2.9×10^{-5} *11*; α(P)=2.0×10^{-6} *11* E_γ: Others: 695.12 *10* (1972Pr04), 695.3 *2* (1970Be06). I_γ: Others: 0.072 *14* (1972Pr04), 0.09 *2* (1970Be06).
709.924 *13*	0.053 *2*	848.905	$5/2^+$	138.946	$5/2^+$	[M1,E2]	0.020 *10*	α(K)=0.016 *8*; α(L)=0.0028 *11*; α(M)=0.00064 *23* α(N)=0.00016 *6*; α(O)=2.7×10^{-5} *11*; α(P)=1.9×10^{-6} *10* E_γ: Weighted ave. of 709.904 *27* (2012Kr05), 709.93 *15* (1972Pr04), 710.0 *4* (1970Be06). I_γ: Others: 0.052 *13* (1972Pr04), 0.04 *2* (1970Be06).
712.188[#] *10*	0.431[#] *4*	712.197	$3/2^+$	0.0	$3/2^+$	[M1,E2]	0.020 *10*	α(K)=0.016 *8*; α(L)=0.0027 *11*; α(M)=0.00063 *23* α(N)=0.00016 *6*; α(O)=2.7×10^{-5} *11*; α(P)=1.9×10^{-6} *10* E_γ: Others: 712.10 *10* (1972Pr04), 712.1 *2* (1970Be06). I_γ: Others: 0.39 *6* (1972Pr04), 0.50 *5* (1970Be06).
735.32[#] *3*	0.027[#] *1*	874.279	$3/2^+$,$5/2^+$	138.946	$5/2^+$	[M1,E2]	0.018 *9*	α(K)=0.015 *8*; α(L)=0.0025 *10*; α(M)=0.00058 *21* α(N)=0.00014 *6*; α(O)=2.5×10^{-5} *10*; α(P)=1.8×10^{-6} *9* E_γ: Others: 735.3 *3* (1972Pr04), 735.5 *4* (1970Be06). I_γ: Others: 0.027 *7* (1972Pr04), 0.030 *6* (1970Be06).
775.9[‡] *3*	0.010[‡] *5*	848.905	$5/2^+$	73.037	$1/2^+$	[E2]	0.00876	α(K)=0.00697 *10*; α(L)=0.001371 *20*; α(M)=0.000323 *5* α(N)=7.90×10^{-5} *11*; α(O)=1.351×10^{-5} *19*; α(P)=7.94×10^{-7} *12*
778.43 *19*	0.047 *1*	1077.81	$(3/2^-,5/2^-)$	299.381	$7/2^-$	[M1,E2]	0.016 *8*	α(K)=0.013 *6*; α(L)=0.0022 *9*; α(M)=0.00050 *19* α(N)=0.00012 *5*; α(O)=2.2×10^{-5} *9*; α(P)=1.5×10^{-6} *8* E_γ: Using the Limitation of relative statistical Weight method of 778.513 *14* (2012Kr05), 778.48 *15* (1972Pr04), and 777.4 *4* (1970Be06). I_γ: Others: 0.042 *9* (1972Pr04), 0.06 *2* (1970Be06).
784.43 *5*	0.017 *2*	964.41	$1/2^+$	180.070	$3/2^+$	[M1,E2]	0.016 *7*	α(K)=0.013 *6*; α(L)=0.0021 *8*; α(M)=0.00049 *18* α(N)=0.00012 *5*; α(O)=2.1×10^{-5} *8*; α(P)=1.5×10^{-6} *8*

$^{193}_{77}Ir_{116}$-13

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18 (continued)

$\gamma(^{193}Ir)$ (continued)

E_γ	I_γ[h]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	α[f]	Comments
								E_γ: Weighted average of 784.447 *56* (2012Kr05), 784.2 *2* (1972Pr04), and 784.2 *4* (1970Be06). I_γ: Others: 0.017 *4* (1972Pr04), 0.02 *1* (1970Be06).
800.9‡ *3*	0.008‡ *4*	874.279	$3/2^+,5/2^+$	73.037	$1/2^+$	[M1,E2]	0.015 *7*	α(K)=0.012 *6*; α(L)=0.0020 *8*; α(M)=0.00047 *17* α(N)=0.00011 *5*; α(O)=2.0×10^{-5} *8*; α(P)=1.4×10^{-6} *7*
848.944# *16*	0.114# *3*	848.905	$5/2^+$	0.0	$3/2^+$	[M1,E2]	0.013 *6*	α(K)=0.011 *5*; α(L)=0.0017 *7*; α(M)=0.00040 *15* α(N)=0.00010 *4*; α(O)=1.7×10^{-5} *7*; α(P)=1.2×10^{-6} *6* E_γ: Others: 848.85 *15* (1972Pr04), 848.9 *4* (1970Be06). I_γ: Others: 0.11 *2* (1972Pr04), 0.12 *2* (1970Be06).
874.306 *25*	0.48 *3*	874.279	$3/2^+,5/2^+$	0.0	$3/2^+$	[M1,E2]	0.012 *6*	α(K)=0.010 *5*; α(L)=0.0016 *6*; α(M)=0.00037 *14* α(N)=9.E−5 *4*; α(O)=1.6×10^{-5} *6*; α(P)=1.2×10^{-6} *6* E_γ: From 2012Kr05. Others: 874.36 *15* (1972Pr04), 874.2 *3* (1970Be06). I_γ: Weighted ave. of 0.46 *3* (2012Kr05), 0.48 *7* (1972Pr04), 0.58 *6* (1970Be06).
891.34# *3*	0.067# *3*	964.41	$1/2^+$	73.037	$1/2^+$	[M1,E2]	0.011 *5*	α(K)=0.009 *5*; α(L)=0.0015 *6*; α(M)=0.00036 *13* α(N)=9.E−5 *4*; α(O)=1.5×10^{-5} *6*; α(P)=1.1×10^{-6} *5* E_γ: Others: 891.26 *15* (1972Pr04), 891.0 *4* (1970Be06). I_γ: Others: 0.072 *11* (1972Pr04), 0.080 *12* (1970Be06).

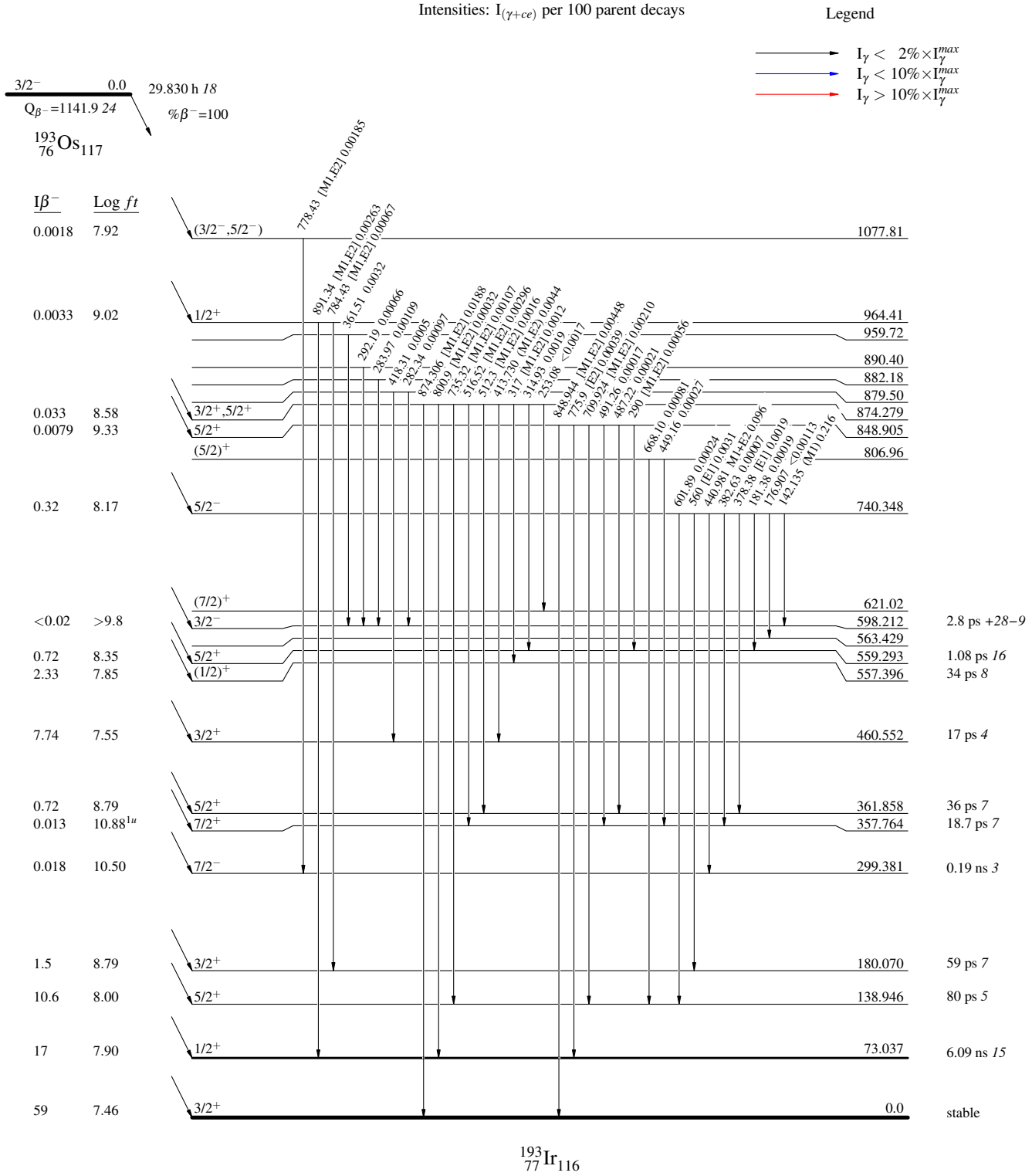
† From 1972Pr04; seen in coincidence spectra only.
‡ From 1972Pr04.
# From 2012Kr05.
@ From 2005Za15. Coincidence measurements − for transition intensity Iγ, summation for angular dependence assumed to be a constant.
& Using the Limitation of relative statistical weight method of values listed in comments section.
[a] ΔE(559.26γ-557.36γ)=1.9 *1* (1967Me12). From analysis of complex γ-line obtained withGe(Li) detector using I(557γ)/I(559γ)=3.0 *6*.
[b] From conversion electron data in 1972Pr04, 1970Be06, and others, unless noted otherwise.
[c] Additional information 1.
[d] Signed values are from 1984Gh01 and unsigned ones from internal conversion coefficient data; exceptions are noted. 1984Gh01 performed a combined analysis of angular correlation and nuclear orientation data, using δ(138.9γ)=0.329 *12* from ICC. The Ice data have been normalized by the evaluators (2006Ac01) at the theoretical α(K) for the 138.9γ; their average (LWM) was used to deduce ICC using the adopted Iγ, and were fitted to δ following 1980Ry04 algorithm. Some of these values are listed in comments section.
[e] From $\gamma(\theta$,H,T) (1973Kr05,1984Gh01).
[f] Additional information 2.
[g] If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
[h] For absolute intensity per 100 decays, multiply by 0.0388 *5*.
[i] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{193}_{77}Ir_{116}$-14

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

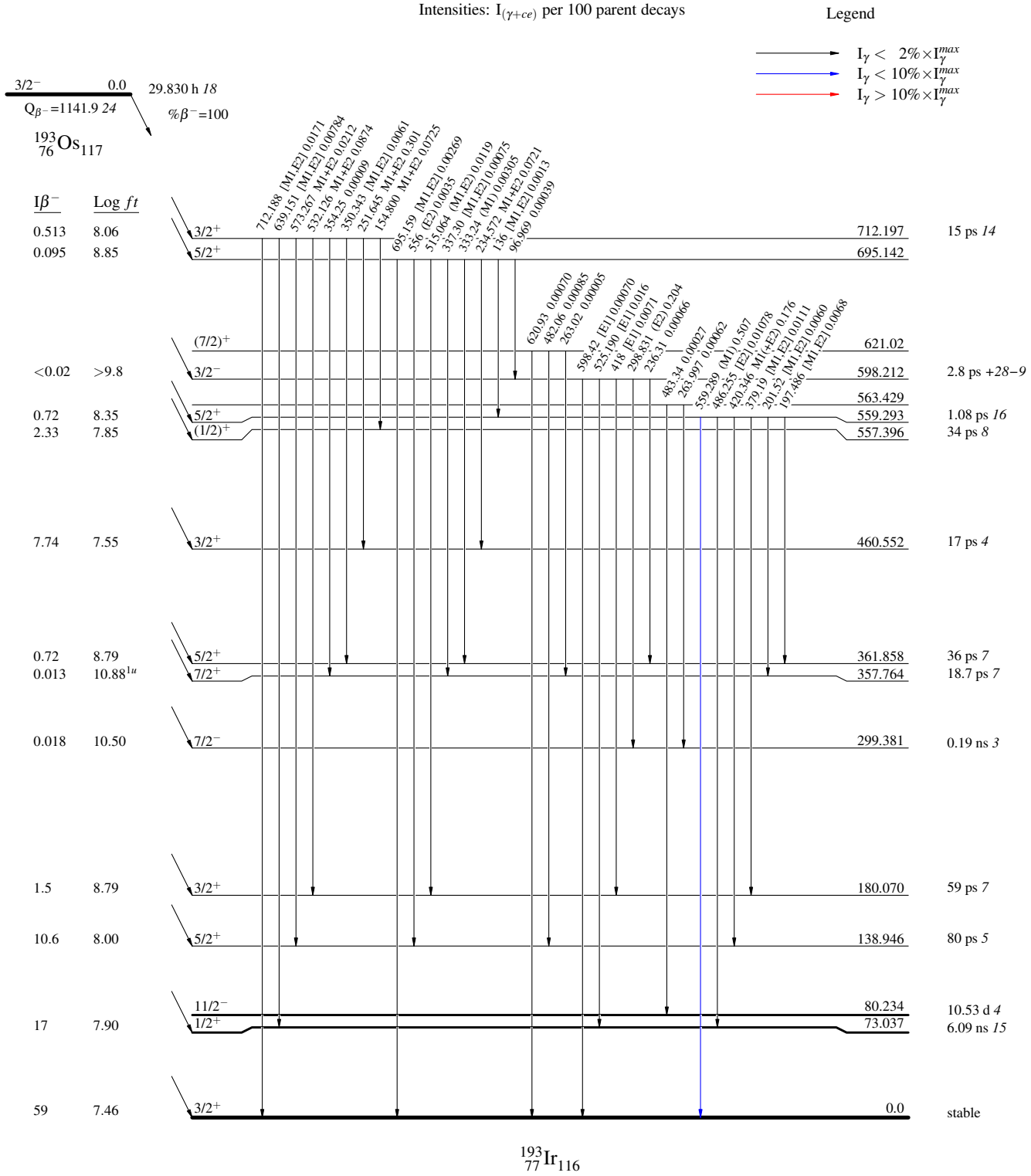


$^{193}_{77}Ir_{116}$

^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18

Decay Scheme (continued)

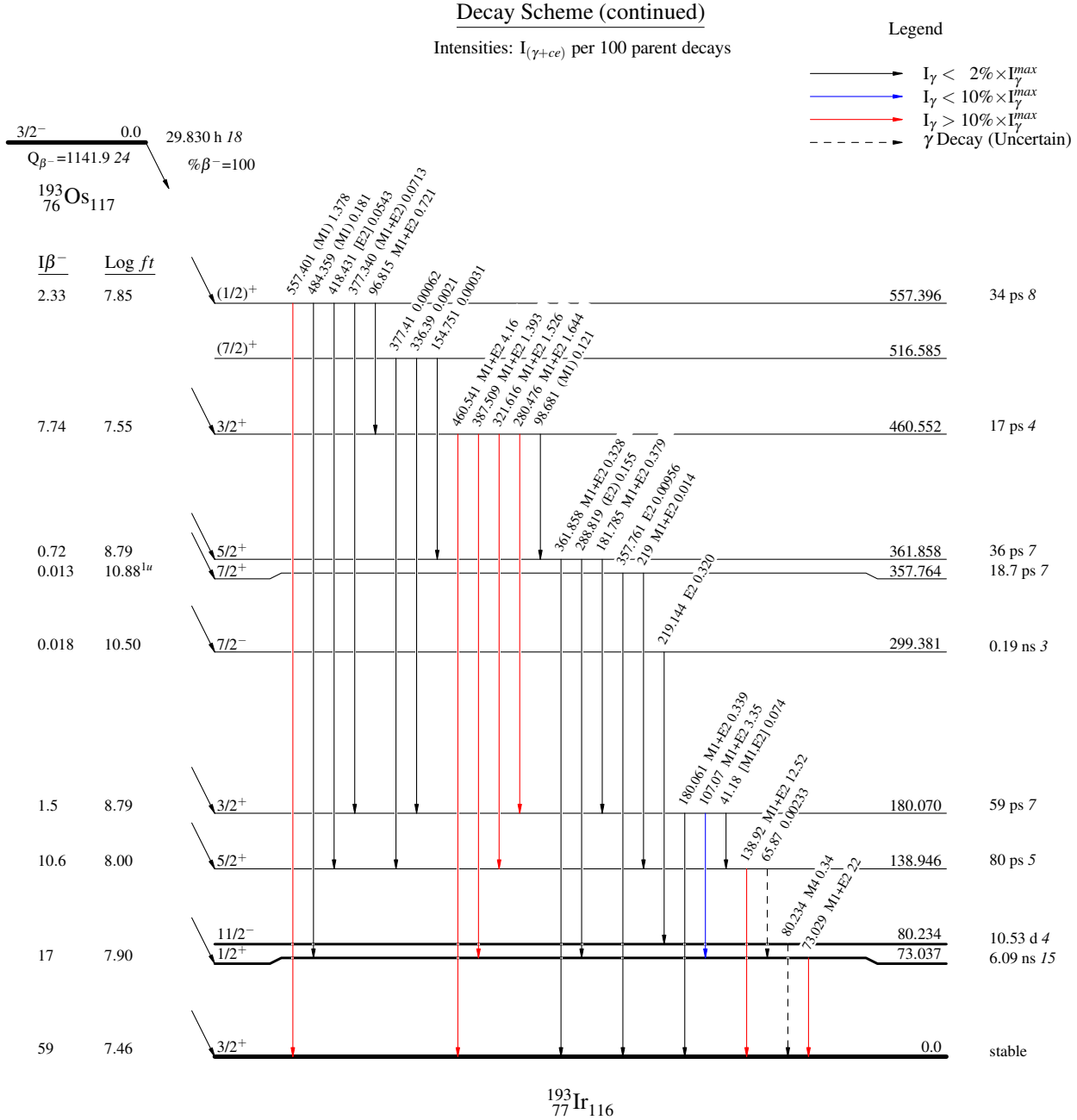
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{193}Os β^- decay 1972Pr04,2012Kr05,2002Ma18

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



$^{193}_{77}Ir_{116}$