^{191}Os β^- decay (14.99 d) 1969Ma07,2005Ni12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Parent: ^{191}Os: E=0; J$^\pi$=9/2$^-$; $T_{1/2}$=14.99 d *2*; Q(β^-)=313.6 *11*; %β^- decay=100

1969Ma07: ^{190}Os(n,γ); Ge(Li); double focusing magnetic spec; ce-ce delayed coin.

2005Ni12: ^{190}Os(n,γ); accurately calibrated HPGe (2002Ha61).

I(L_β x ray)=0.394 *35*, I(L_α x ray)=0.281 *34*, I(L_γ x ray)=0.091 *11*, I(L_1 x ray)=0.011 *10*, Ge(Li) (1989BeYR).

Measured I(L_1 x ray)/I(K x ray)=0.0312 *19*, I(L_1 x ray)/I(129γ)=0.0608 *41*, Si(Li), germanium detector. Deduced L1 atomic fluorescence yield ω(L1)=0.152 *14* (1993Ma52).

^{191}Ir Levels

E(level)[&]	J$^\pi$[†]	$T_{1/2}$	Comments
0.0[‡]	3/2$^+$	stable	
82.423[#] *10*	1/2$^+$	4.10 ns *7*	J$^\pi$: %β^- feeding of 0.09 *7* from transition intensity balance is consistent with J^π=1/2$^+$. %β^- feeding estimated based ce(L)(47.0):ce(L)(82.4) exp=96 *20*:32 *3* (1969Ma07 with uncertainty in ce(L)(47.0) including 20% for E(ce) energy range). $T_{1/2}$: From Adopted Levels.
129.432[‡] *5*	5/2$^+$	122 ps *6*	$T_{1/2}$: coincidence peak centroid shift method, weighted average of: 126 ps *11* (1969Ma07), 125 ps *12*(1966Ra01), 80 ps *16* (1962Be46) ce-β; 131 ps *10* (1962Li12) ce-ce in ^{191}Pt ε decay.
171.278[@] *23*	11/2$^-$	4.899 s *23*	$T_{1/2}$: from ^{191}Ir IT decay.

† From Adopted Levels.
‡ Band(A): 3/2[402].
\# Band(B): 1/2[400] (possibly mixed with K-2 γ-vibration coupled to 3/2[402]).
@ Band(C): 11/2[505].
& From a least-squares fit to γ-ray energies.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(142.3 *15*)	171.278	100	5.322 *11*	av Eβ=37.73 *31* E(decay): Measured values: 143 keV *3* (1958Na15), 142 keV *3* (1948Sa18); 143 keV *2* (1951Ko17); 135 keV 5 (1958Jo22); 125 keV *3* (1960Fe03); 147 keV *3* (1963Pl01).

† Absolute intensity per 100 decays.

γ(^{191}Ir)

Iγ normalization: Iγ per 100 parent decay, assuming β feeding only to the 11/2$^-$ state.

Others: 1948Ka08, 1948Sa18, 1950Ch11, 1950Bu51, 1951Ko17, 1952Jo23, 1952Sw57, 1953Hi03, 1954Bu02, 1954Mc10, 1954Na34, 1955Mi04, 1956Ca50, 1958Na15, 1958Du76, 1958Jo22, 1958Cl42, 1960Fe03, 1964De06, 1967Ag07, 1970Mi15.

Angular correlation measurements: ce $\gamma(\theta)$ (1964De06), X$\gamma(\theta)$ (1971Ge14).

Mult(41.85γ): from ce(L1):ce(L2):ce(L3):ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=3.86 *39*:214 *5*: 216.8 *17*:1.3 *8*:59.7 *7*:62.4 *12*:3.37 *15*:5.81 *41* (1971Pl05). Other values: ce(L1):ce(L2):ce(L3) exp=25:100:108, ce(L)/ce(M) exp=3.5 *3*, ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=2:100:100:6:12 (1966Ma50); ce(L1):ce(L2):ce(L3):ce(M) exp=1.1 *2*:100 *5*:108 *5*:60 *5* (1969Ma07); ce(L1)/ce(L3) exp=0.0183 *13*, ce(L2)/ce(L3) exp=0.987 *16*, ce(M1)/ce(M3) exp=0.0178 *15*, ce(M2)/ce(M3) exp=0.971 *23*, ce(M4)/ce(M3) exp=0.0649 *38*, ce(M5)/ce(M3) exp=0.0937 *51*, ce(N3)/ce(M3) exp=0.240 *13*, ce(N1)+ce(N2)/ce(N3) exp=1.08 *7*, ce(N4)/ce(N5) exp=0.175 *12*, ce(O)+ce(p)/ce(N3) exp=0.367 *18* (1972Br02); α(exp)=(1.35+2.11−0.52)E4 (1965La05). α(exp)=13709 *1900*; α(L)exp=11700 *2100* (1986Bh02).

δ(82.427γ): In ^{191}Os β^- decay: δ=0.88 *7* from ce(L1):ce(L2):ce(L3) exp=67 *10*:150 *20*:120 *15* (1969Ma07). Other ce data: ce(L1):ce(L2):ce(L3) exp=1.6:3:2 (1963Pl01); ce(L2)/ce(L3) exp=2.2 (1967Pl01).

δ(129.431γ): In ^{191}Os β^- decay, the following measurements gave precise results: δ=0.396 *4* from ce(L1):ce(L2):ce(L3) exp=100:30.0 *8*:16.6 *3* (given as 100:0.300 8:0.166 *3* by the authors, probably a misquote) (1972Br02); δ=0.404 *12* from ce(L1)+ce(L2):ce(L3) exp=7.55 *35* (1964De06). Other: δ=0.386 *22* from ce(L1):ce(L2):ce(L3) exp=36 *4*:9 *1*:5.5 *6* (1969Ma07). Other subshell ratios: ce(K):ce(L1):ce(L2):ce(L3) exp=1000:139:42:24 (1967Pl01); ce(K):ce(L) exp=4.4 *2*, ce(L1):ce(L2):ce(L3) exp= 640:167:100, ce(L)/ce(M) exp=4.7 *4*, ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=46:12:10: <1: <1 (1966Ma50); ce(K):ce(L1)+ce(L2):ce(L3):ce(M):ce(n)+ce(O) exp=100:25:3.5:6.1:2.4 (1963Pl01).

E_γ	I_γ ‡#	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α †	Comments
41.846 *22*	0.005885 *8*	171.278	11/2$^-$	129.432	5/2$^+$	E3		1.699×10^4 *24*	α(L)=1.220×10^4 *17*; α(M)=3.73×10^3 *5* α(N)=925 *13*; α(O)=136.5 *20*; α(P)=0.1455 *21* E$_\gamma$: weighted average of 41.85 keV *1* (1966Ma50), 41.85 keV *3* (1971Pl05), 41.76 keV *2* (1967Pl01), 41.83 keV *3* (1963Pl01), and 41.92 keV *2* (1969Ma07). I$_\gamma$: from I(γ+ce)(41.8)=100 and adopted α. Mult.: from subshell ratios, see values under the heading.
47.05 *3*	0.0025 *3*	129.432	5/2$^+$	82.423	1/2$^+$	E2		143.5 *21*	α(L)=108.1 *16*; α(M)=27.7 *4* α(N)=6.68 *10*; α(O)=1.010 *14*; α(P)=0.000955 *14* E$_\gamma$: from 1969Ma07, Ge(Li). Other values: 46.90 keV *6* (1967Pl01); 47.004 *3* (1995BuZZ). I$_\gamma$: from ce(L)(47.0):ce(K)(129.4)exp=0.96 *7*:206 *15* (1969Ma07) and corresponding theoretical values for adopted multipolarities. Other: Iγ(47.0)/Iγ(129.4)<0.0015 (1969Ma07) Ge(Li). Mult.: from ce(L1):ce(L2):ce(L3) exp=3 *2*:48 *5*:45 *5* (1969Ma07).
82.427 *10*	0.031 *3*	82.423	1/2$^+$	0.0	3/2$^+$	M1+E2	−0.871 *18*	10.54 *15*	α(K)=5.33 *11*; α(L)=3.94 *8*; α(M)=0.991 *21*

$^{191}_{77}$Ir$_{114}$-2

γ(^{191}Ir) (continued)

E_γ	I_γ ‡#	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α †	Comments
									α(N)=0.240 *5*; α(O)=0.0377 *8*; α(P)=0.000688 *14* E_γ: from 1970Ra37, cryst. Other values: 82.46 keV *4* (1969Ma07); 82.52 keV *3* (1966Ma50); 82.5 keV *3* (1963Pl01), scin Xγ, 82.428 *3* (1995BuZZ). I_γ: using I(γ+ce)(82.4)=I(γ+ce)(47.0) from decay scheme, adopted α, and Iγ(47.0). Other: Iγ(92.4)/Iγ(129.0)=0.0010 *5* (1969Ma07), Ge(Li). Mult.,δ: From adopted gammas.
129.431 *5*	26.50 *4*	129.432	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.400 *5*	2.75 *4*	α(K)=2.148 *31*; α(L)=0.463 *7*; α(M)=0.1100 *16* α(N)=0.0269 *4*; α(O)=0.00459 *7*; α(P)=0.000264 *4* E_γ: from 1970Ra37, cryst. Other: 129.432 *1* (1995BuZZ). I_γ: from I(γ+ce)(129.4)+I(γ+ce)(47.0)=100, adopted Iγ(47.0), and adopted α. Mult.,δ: From adopted gammas. Other values: δ=−0.28 *6* (1964Ca11) γγ(θ,H,t). α: α(K)exp=2.134 *14* (2005Ni12) from α(K)ω(K)= 2.044 *11*, ratio between K x ray and γ with a specially calibrated HPGe detector, and using ω(K)=0.958 *4* (1996Sc06). Other: α(K)exp=1.94 *10* (1963Pl01); α(K)exp=2.32 *6* (1965La05). See 1979Gi01, 1981Gi11, 1984El03, and 1984Sa13 for measurements of linear and circular polarizations, respectively, of this γ in an external magnetic field.

† Additional information 1.

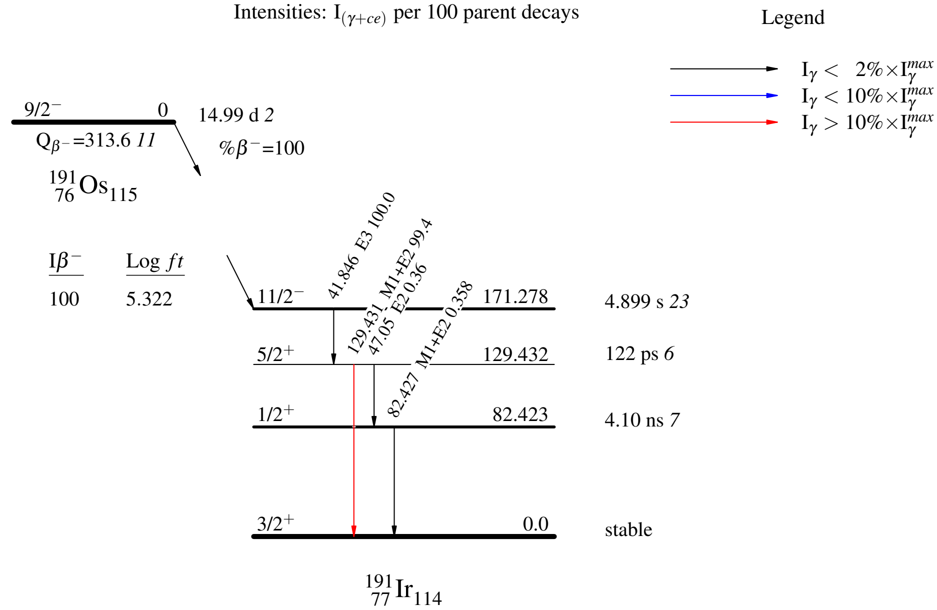
‡ Iγ per 100 parent decay deduced by evaluator assuming β feeding only to the 11/2$^-$ state and considering Iγ(47)(1+α)= Iγ(82.4)(1+α). These data are more consistent with the data presented in 1986BrZQ and 1978LeZA. The data presented in 1995Br38, from selected Ice of 1969Ma07 and α, assuming no β^- feeding to g.s., was slightly higher. The data are in radioactive equilibrium with ^{191}Ir(4.9 s). Comparison of Ice for E(ce) differing more than 20 keV have an additional 20% of relative uncertainty due to differences in absorption (1969Ma07). Precise Iγ values result from decay scheme characteristics.

Absolute intensity per 100 decays.

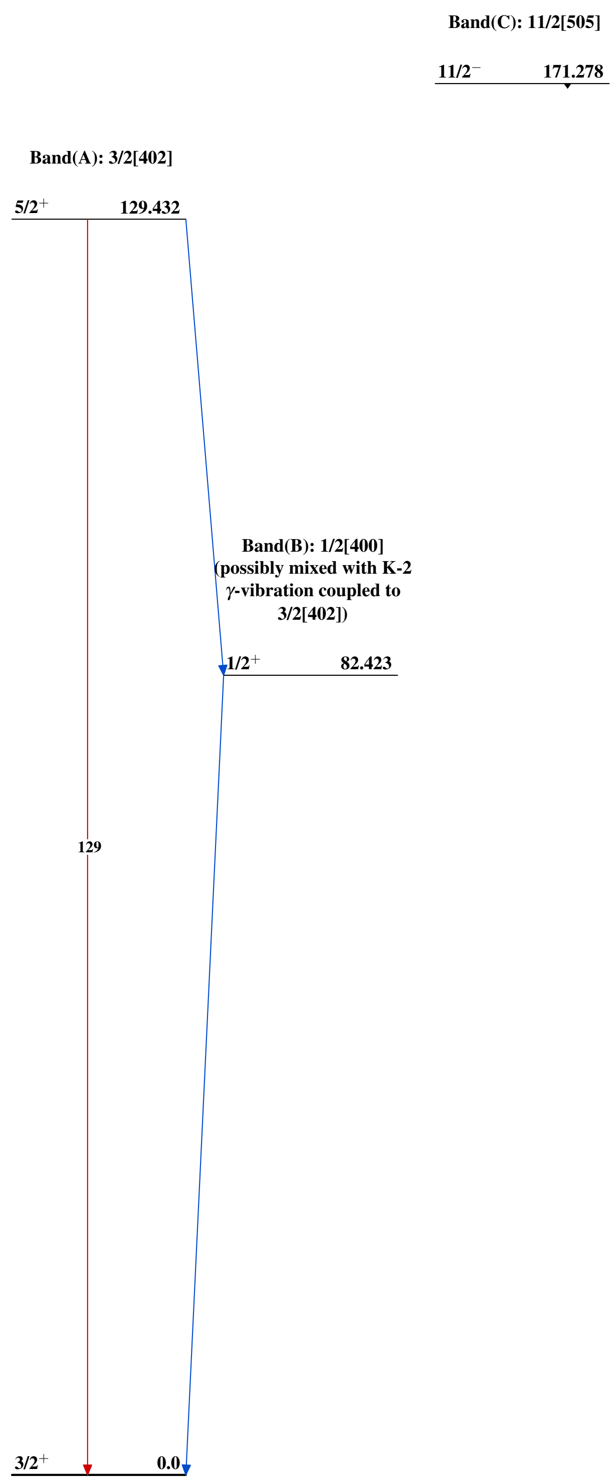
^{191}Os β^- decay (14.99 d) 1969Ma07,2005Ni12

Decay Scheme

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



^{191}Os β^- decay (14.99 d) 1969Ma07,2005Ni12



$^{191}_{77}Ir_{114}$