^{190}Re β^- decay (3.1 h) 1974Ya02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, [1] and Jun Chen[2]	NDS 169,1 (2020)	15-Oct-2020

Parent: ^{190}Re: E=204 *10*; J$^\pi$=(6$^-$); $T_{1/2}$=3.1 h *2*; Q(β^-)=3125 *5*; %β^- decay=54.4 *20*

^{190}Re-E,J$^\pi$,$T_{1/2}$,Q(β^-): From the Adopted Levels of ^{190}Re. Other: Q(β^-)=3070 *70* (2017Wa10).

^{190}Re-%β^- decay: Deduced by the evaluators from γ+ce intensity balances of γ transitions in ^{190}Os from β^- decays of the 3.0-min g.s. and the 3.1-h isomer of ^{190}Re in equilibrium (which means the total number of ^{190}Re g.s. decays is equal to the total number of ^{190}Re IT decays that feeds the g.s.) measured by 1974Ya02, based on that the 2352, 1996 and 1387 levels are the only levels fed directly by the β^- decay of the 3.0-min g.s. but not by the β^- decay of the 3.1-h isomer and the 2352 and 1996 levels are not populated in the β^- decay of the 3.1-h isomer, as claimed by 1974Ya02. So the %IT branching is determined by the total I(γ+ce) from 2352, 1996 and 1387 levels in ^{190}Re g.s. decay, divided by the total I(γ+ce) of transitions to 187 level, 558γ and 1387γ from β^- decays of ^{190}Re g.s. and isomer combined. This gives %IT=45.6 *20* and %β^-=54.4 *20*.

1974Ya02 (also 1974YaZU, 1972Da07): sources of the ^{190} isomer were produced by the ^{190}Os(d,α) reaction with 18 MeV deuterons provided by the ANL 152-cm cyclotron on a 50-mg target of natural osmium.γ rays were detected with Ge(Li) detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, γ(t). Deduced levels, J, π, parent $T_{1/2}$, configurations, γ-ray multipolarities, β-decay branching ratios. Comparisons with theoretical calculations. 1974Ya02 also report data on ^{190}Ir ε decay (11.78 d) and ^{189}Os(d,p).

Others:

γ: 1972Ru06, 1972KaYS, 1964Fl02.

β^-: 1964Fl02.

$T_{1/2}$ (^{190}Re): 1974Ya02, 1973DeWI, 1972Ru06, 1966BaZY, 1962Ba60.

Total deposit energy of 1801 keV *85* calculated by RADLIST code is in agreement with expected value of 1784 *81* from Q(β^-)=3125 keV *5* and the adopted branching ratio.

^{190}Os Levels

E(level)†	J$^\pi$‡	Comments
0.0	0$^+$	
186.69 *4*	2$^+$	
547.88 *5*	4$^+$	
557.92 *5*	2$^+$	
755.91 *5*	3$^+$	
955.23 *5*	4$^+$	
1050.43 *10*	6$^+$	
1163.10 *5*	4$^+$	
1203.82 *7*	5$^+$	
1386.91 *5*	3$^-$	
1446.01 *6*	(5)$^+$	
1513.9? *5*	(6$^+$,5$^+$)	
1583.84? *12*	4$^-$	Population in ^{190}Re decay is suspect since the only γ ray reported is 1036.0, other γ rays of comparable intensity such as 196.8γ, 380.0γ, 420.6γ are not reported.
1666.51 *17*	8$^+$	
1681.60 *7*	5$^-$	
1708.2? *3*	(2$^+$,3,4$^+$)	
1836.21 *7*	(6$^+$)	
1872.10 *12*	(5)$^-$	
2061.2? *2*	(6$^+$,7$^-$)	
2068.79 *9*	(5$^+$)	
2121.28 *13*	(5,6$^+$)	

† From a least-squares fit to γ-ray energies.

‡ From the Adopted Levels.

^{190}Re β^- decay (3.1 h) 1974Ya02 (continued)

β^- radiations

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(1208 *11*)	2121.28	3.4 *4*	7.7 *2*	av Eβ=394 *35*
(1260 *11*)	2068.79	3.9 *3*	7.7 *2*	av Eβ=415 *35*
(1268‡ *11*)	2061.2?	1.88 *18*	8.1 *2*	av Eβ=418 *35*
(1457 *11*)	1872.10	0.89 *8*	8.6 *1*	av Eβ=495 *36*
(1493 *11*)	1836.21	17.0 *14*	7.4 *1*	av Eβ=510 *36*
(1647 *11*)	1681.60	7.4 *7*	7.9 *1*	av Eβ=574 *36*
(1663 *11*)	1666.51	0.55 *13*	9.9^{1u} *2*	av Eβ=569 *35*
(1815‡ *11*)	1513.9?	4.7 *9*	8.3 *2*	av Eβ=644 *37*
(1883 *11*)	1446.01	1.9 *6*	8.7 *2*	av Eβ=673 *37*
(2125 *11*)	1203.82	1.8 *7*	8.9 *2*	av Eβ=776 *37*
(2166‡ *11*)	1163.10	<2.7	>9.9^{1u}	av Eβ=774 *36*
(2279 *11*)	1050.43	1.8 *2*	9.1 *1*	av Eβ=842 *38*
(2374‡ *11*)	955.23	<2.9	>10.1^{1u}	av Eβ=861 *37*
(2781‡ *11*)	547.88	<3.6	>10.4^{1u}	av Eβ=1034 *37*

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{190}Os)

Iγ normalization: From Σ[I(γ+ce) of 558γ, 1387γ and all γ rays to 187 level]=100, Most of the unplaced intensity (49 units on relative scale) is associated with transitions of energy <800 keV, not expected to proceed to g.s. or the 187 level.

Combined intensities given under comments are the total γ intensities for the 3.1-h (isomer) and 3.0-min (g.s.) activities in equilibrium (1974Ya02), where applicable.

E$_\gamma$[†]	I$_\gamma$[‡c]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[b]	δ[b]	α[d]	Comments
[x]108.67 *15*	1.52 *14*								%Iγ=0.31 *4*
[x]114.18 *15*	0.92 *15*								%Iγ=0.18 *4*
[x]127.27 *6*	1.95 *17*								%Iγ=0.39 *4*
[x]163.14 *6*	2.65 *17*								%Iγ=0.53 *5*
[x]182.1 *3*	3.9 *4*								%Iγ=0.78 *9*
186.68 *4*	140[@] *7*	186.69	2$^+$	0.0	0$^+$	E2		0.420	%Iγ=28.2 *13* α(K)=0.203 *3*; α(L)=0.1642 *23*; α(M)=0.0415 *6* α(N)=0.00997 *14*; α(O)=0.001504 *21*; α(P)=1.88×10^{-5} *3*
(196.85[#] *15*)	1.9[#] *2*	1583.84?	4$^-$	1386.91	3$^-$	E2+M1	+1.0 *5*	0.59 *15*	%Iγ=0.38 *5* α(K)=0.43 *16*; α(L)=0.121 *7*; α(M)=0.0292 *24* α(N)=0.0071 *6*; α(O)=0.00113 *5*; α(P)=4.8×10^{-5} *19*
198.08 *20*	4.8 *8*	755.91	3$^+$	557.92	2$^+$	E2+M1	−9 *+2−5*	0.349 *7*	%Iγ=0.97 *17* α(K)=0.180 *5*; α(L)=0.1277 *19*; α(M)=0.0321 *5* α(N)=0.00773 *12*; α(O)=0.001171 *18*; α(P)=1.70×10^{-5} *6* combined intensity=8.7 *12*.
199.3 *3*	1.3 *3*	955.23	4$^+$	755.91	3$^+$	E2		0.336	%Iγ=0.26 *7* α(K)=0.1712 *25*; α(L)=0.1246 *20*; α(M)=0.0314 *5* α(N)=0.00755 *12*; α(O)=0.001143 *18*; α(P)=1.604×10^{-5} *24* combined intensity=2.0 *5*.
[x]200.0 *3*	6.3 *4*								%Iγ=1.27 *11*
207.91[e] *6*	2.4[e] *5*	755.91	3$^+$	547.88	4$^+$	E2(+M1)	−16 *+5−20*	0.293	%Iγ=0.48 *11* α(K)=0.155 *3*; α(L)=0.1045 *15*; α(M)=0.0263 *4* α(N)=0.00632 *9*; α(O)=0.000959 *14*; α(P)=1.47×10^{-5} *3* combined intensity=4.3 *8*.
207.91[e] *6*	0.7[e] *2*	1163.10	4$^+$	955.23	4$^+$	(E2)		0.291	%Iγ=0.14 *4* α(K)=0.1533 *22*; α(L)=0.1045 *15*; α(M)=0.0263 *4* α(N)=0.00632 *9*; α(O)=0.000959 *14*; α(P)=1.446×10^{-5} *21* combined intensity=1.0 *3*.
223.81 *5*	2.8[a] *3*	1386.91	3$^-$	1163.10	4$^+$	E1		0.0500	%Iγ=0.56 *7* α(K)=0.0414 *6*; α(L)=0.00669 *10*; α(M)=0.001530 *22* α(N)=0.000370 *6*; α(O)=6.15×10^{-5} *9*; α(P)=3.76×10^{-6} *6* combined intensity=61.8 *25*.
242.3 *3*	0.71 *7*	1446.01	(5)$^+$	1203.82	5$^+$	[M1,E2]		0.32 *15*	%Iγ=0.143 *17*

$^{190}_{76}Os_{114}$-3

γ(^{190}Os) (continued)

E_γ[†]	I_γ[‡c]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	δ[b]	α[d]	Comments
									α(K)=0.24 *14*; α(L)=0.059 *3*; α(M)=0.01407 *22* α(N)=0.00341 *7*; α(O)=0.00056 *4*; α(P)=2.7×10^{-5} *18*
^{x}252.65 *20*	0.63 *7*								%Iγ=0.127 *16*
^{x}255.19 *10*	2.42 *19*								%Iγ=0.49 *5*
282.93 *6*	11.1 *8*	1446.01	(5)$^+$	1163.10	4$^+$	E2(+M1)	>2.5	0.122 *14*	%Iγ=2.23 *20* α(K)=0.081 *13*; α(L)=0.0313 *8*; α(M)=0.00771 *16* α(N)=0.00186 *4*; α(O)=0.000290 *9*; α(P)=8.4×10^{-6} *16*
284.9 *3*	2.2 *3*	2121.28	(5,6$^+$)	1836.21	(6$^+$)	[D,E2]		0.17 *14*	%Iγ=0.44 *7*
288.22 *10*	2.35 *14*	1872.10	(5)$^-$	1583.84?	4$^-$	E2+M1	2.2 +*11*−*5*	0.135 *17*	%Iγ=0.47 *4* α(K)=0.095 *16*; α(L)=0.0302 *10*; α(M)=0.00736 *18* α(N)=0.00178 *5*; α(O)=0.000282 *10*; α(P)=1.01×10^{-5} *19*
^{x}294.75[e] *12*	7.1[e] *6*								%Iγ=1.43 *15*
294.75[e] *12*	6.4[e&] *6*	1681.60	5$^-$	1386.91	3$^-$	(E2)		0.0963	%Iγ=1.29 *14* α(K)=0.0618 *9*; α(L)=0.0262 *4*; α(M)=0.00649 *10* α(N)=0.001565 *22*; α(O)=0.000243 *4*; α(P)=6.19×10^{-6} *9*
^{x}315.56 *8*	5.0 *3*								%Iγ=1.01 *9*
321.81[f] *8*	3.8 *4*	1836.21	(6$^+$)	1513.9?	(6$^+$,5$^+$)	[M1,E2]		0.14 *7*	%Iγ=0.76 *9* α(K)=0.11 *7*; α(L)=0.024 *5*; α(M)=0.0056 *9* α(N)=0.00135 *23*; α(O)=0.00022 *5*; α(P)=1.3×10^{-5} *8*
^{x}344.09 *10*	6.0 *3*								%Iγ=1.21 *9*
361.09 *5*	60 *5*	547.88	4$^+$	186.69	2$^+$	E2		0.0535	%Iγ=12.1 *10* α(K)=0.0370 *6*; α(L)=0.01255 *18*; α(M)=0.00307 *5* α(N)=0.000742 *11*; α(O)=0.0001169 *17*; α(P)=3.82×10^{-6} *6* combined intensity=93 *4*.
371.24 *5*	52 *3*	557.92	2$^+$	186.69	2$^+$	E2+M1	−8.1 *8*	0.0510	%Iγ=10.5 *8* α(K)=0.0359 *6*; α(L)=0.01151 *17*; α(M)=0.00281 *4* α(N)=0.000679 *10*; α(O)=0.0001074 *16*; α(P)=3.73×10^{-6} *7* combined intensity=100.
379.4[f] *3*	3.6 *3*	2061.2?	(6$^+$,7$^-$)	1681.60	5$^-$	[D,E2]		0.08 *6*	%Iγ=0.72 *8*
387.10 *12*	4.3 *4*	2068.79	(5$^+$)	1681.60	5$^-$	[E1]		0.01349	%Iγ=0.86 *10* α(K)=0.01125 *16*; α(L)=0.001734 *25*; α(M)=0.000395 *6* α(N)=9.58×10^{-5} *14*; α(O)=1.619×10^{-5} *23*; α(P)=1.081×10^{-6} *16*
390.17 *6*	24.0 *14*	1836.21	(6$^+$)	1446.01	(5)$^+$	[M1,E2]		0.09 *5*	%Iγ=4.8 *4* α(K)=0.07 *4*; α(L)=0.013 *4*; α(M)=0.0031 *8* α(N)=0.00075 *19*; α(O)=0.00013 *4*; α(P)=8.E−6 *5*
394.6[f] *4*	2.3 *4*	2061.2?	(6$^+$,7$^-$)	1666.51	8$^+$	[D,E2]		0.07 *6*	%Iγ=0.46 *9*
397.36 *6*	30 *3*	955.23	4$^+$	557.92	2$^+$	E2		0.0412	%Iγ=6.0 *7*

$^{190}_{76}$Os$_{114}$-4

γ(^{190}Os) (continued)

E_γ[†]	I_γ[‡c]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	δ[b]	α[d]	Comments
									α(K)=0.0293 *5*; α(L)=0.00904 *13*; α(M)=0.00220 *3* α(N)=0.000532 *8*; α(O)=8.44×10^{-5} *12*; α(P)=3.05×10^{-6} *5* combined intensity=48.5 *29*.
407.22[e] *6*	21[e] *4*	955.23	4$^+$	547.88	4$^+$	E2+M1	−3.4 +*6*−*9*	0.045 *3*	%Iγ=4.2 *8* α(K)=0.0330 *23*; α(L)=0.0089 *3*; α(M)=0.00214 *6* α(N)=0.000517 *14*; α(O)=8.3×10^{-5} *3*; α(P)=3.5×10^{-6} *3* combined intensity=34 *5*.
407.22[e] *6*	41[e] *4*	1163.10	4$^+$	755.91	3$^+$	E2+M1	−2.6 +*8*−*14*	0.048 *8*	%Iγ=8.2 *8* α(K)=0.036 *8*; α(L)=0.0092 *8*; α(M)=0.00220 *16* α(N)=0.00053 *4*; α(O)=8.6×10^{-5} *8*; α(P)=3.9×10^{-6} *9* combined intensity=63 *6*.
431.62 *7*	1.8[a] *2*	1386.91	3$^-$	955.23	4$^+$	[E1]		0.01056	%Iγ=0.36 *5* α(K)=0.00882 *13*; α(L)=0.001348 *19*; α(M)=0.000307 *5* α(N)=7.44×10^{-5} *11*; α(O)=1.261×10^{-5} *18*; α(P)=8.55×10^{-7} *12* combined intensity=40.1 *24*.
447.81 *8*	14.3 *8*	1203.82	5$^+$	755.91	3$^+$	E2		0.0301	%Iγ=2.88 *22* α(K)=0.0221 *3*; α(L)=0.00611 *9*; α(M)=0.001475 *21* α(N)=0.000357 *5*; α(O)=5.72×10^{-5} *8*; α(P)=2.32×10^{-6} *4*
477.8 *3*	2.1 *9*	1681.60	5$^-$	1203.82	5$^+$	[E1]		0.00845	%Iγ=0.42 *19* α(K)=0.00707 *10*; α(L)=0.001072 *15*; α(M)=0.000244 *4* α(N)=5.91×10^{-5} *9*; α(O)=1.005×10^{-5} *15*; α(P)=6.89×10^{-7} *10*
485.23 *20*	0.68 *7*	1872.10	(5)$^-$	1386.91	3$^-$	E2		0.0245	%Iγ=0.137 *16* α(K)=0.0183 *3*; α(L)=0.00474 *7*; α(M)=0.001141 *16* α(N)=0.000276 *4*; α(O)=4.45×10^{-5} *7*; α(P)=1.94×10^{-6} *3*
490.76 *7*	17.3 *9*	1446.01	(5)$^+$	955.23	4$^+$	(E2)		0.0239	%Iγ=3.5 *3* α(K)=0.0179 *3*; α(L)=0.00458 *7*; α(M)=0.001101 *16* α(N)=0.000267 *4*; α(O)=4.30×10^{-5} *6*; α(P)=1.89×10^{-6} *3*
502.55 *8*	16.8 *5*	1050.43	6$^+$	547.88	4$^+$	E2		0.0225	%Iγ=3.38 *21* α(K)=0.01693 *24*; α(L)=0.00426 *6*; α(M)=0.001022 *15* α(N)=0.000248 *4*; α(O)=4.00×10^{-5} *6*; α(P)=1.80×10^{-6} *3*
518.55 *7*	33.2 *23*	1681.60	5$^-$	1163.10	4$^+$	E1(+M2)	+0.010 *15*	0.00711 *14*	%Iγ=6.7 *6* α(K)=0.00595 *11*; α(L)=0.000897 *19*; α(M)=0.000204 *5* α(N)=4.95×10^{-5} *11*; α(O)=8.42×10^{-6} *19*; α(P)=5.84×10^{-7} *13*
[x]539.21 *25*	1.1 *3*								%Iγ=0.22 *7*
557.95 *7*	70 *6*	557.92	2$^+$	0.0	0$^+$	E2		0.01748	%Iγ=14.1 *12* α(K)=0.01340 *19*; α(L)=0.00312 *5*; α(M)=0.000745 *11* α(N)=0.000181 *3*; α(O)=2.94×10^{-5} *5*; α(P)=1.430×10^{-6} *20* combined intensity=135 *8*.
558.7[f] *5*	27 *4*	1513.9?	(6$^+$,5$^+$)	955.23	4$^+$	[E2]		0.01743	%Iγ=5.4 *8*

$^{190}_{76}$Os$_{114}$-5

^{190}Re β^- decay (3.1 h) 1974Ya02 (continued)

γ(^{190}Os) (continued)

E_γ[†]	I_γ[‡c]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	δ[b]	α[d]	Comments
									α(K)=0.01336 19; α(L)=0.00311 5; α(M)=0.000742 11 α(N)=0.000180 3; α(O)=2.93×10^{-5} 5; α(P)=1.426×10^{-6} 21
569.30 7	69 7	755.91	3$^+$	186.69	2$^+$	E2+M1	−9.8 10	0.01699 25	%Iγ=13.9 13 α(K)=0.01310 20; α(L)=0.00298 5; α(M)=0.000709 10 α(N)=0.0001720 25; α(O)=2.81×10^{-5} 4; α(P)=1.401×10^{-6} 21 combined intensity=125 6.
605.14 7	73 4	1163.10	4$^+$	557.92	2$^+$	E2		0.01447	%Iγ=14.7 10 α(K)=0.01123 16; α(L)=0.00248 4; α(M)=0.000589 9 α(N)=0.0001427 20; α(O)=2.34×10^{-5} 4; α(P)=1.202×10^{-6} 17 combined intensity=111 5.
(615.39[#] 15)	0.86[#] 8	1163.10	4$^+$	547.88	4$^+$	[M1,E2]		0.026 13	%Iγ=0.173 19 α(K)=0.021 11; α(L)=0.0037 14; α(M)=0.0009 3 α(N)=0.00021 8; α(O)=3.5×10^{-5} 13; α(P)=2.4×10^{-6} 13
616.08 14	5.1 4	1666.51	8$^+$	1050.43	6$^+$	E2		0.01389	%Iγ=1.03 10 α(K)=0.01081 16; α(L)=0.00236 4; α(M)=0.000559 8 α(N)=0.0001357 19; α(O)=2.23×10^{-5} 4; α(P)=1.157×10^{-6} 17
630.91 16	1.9[a] 3	1386.91	3$^-$	755.91	3$^+$	[E1]		0.00472	%Iγ=0.38 7 α(K)=0.00396 6; α(L)=0.000588 9; α(M)=0.0001335 19 α(N)=3.24×10^{-5} 5; α(O)=5.54×10^{-6} 8; α(P)=3.92×10^{-7} 6 combined intensity=42 6.
≈633	5 3	1836.21	(6$^+$)	1203.82	5$^+$	[M1,E2]		≈0.025	%Iγ=1.0 6 α(K)≈0.020; α(L)≈0.0034; α(M)≈0.0008 α(N)≈0.00019; α(O)≈3.3×10^{-5}; α(P)≈2.2×10^{-6}
656.02 8	5.3 4	1203.82	5$^+$	547.88	4$^+$	E2+M1	−1.7 14	0.017 14	%Iγ=1.07 10 α(K)=0.014 12; α(L)=0.0026 15; α(M)=0.0006 4 α(N)=0.00015 9; α(O)=2.5×10^{-5} 15; α(P)=1.5×10^{-6} 14
673.10 10	46.9 24	1836.21	(6$^+$)	1163.10	4$^+$	[E2]		0.01138	%Iγ=9.4 7 α(K)=0.00896 13; α(L)=0.00186 3; α(M)=0.000438 7 α(N)=0.0001063 15; α(O)=1.756×10^{-5} 25; α(P)=9.61×10^{-7} 14
675.2 6	2.6 10	2121.28	(5,6$^+$)	1446.01	(5)$^+$	[D,E2]		0.018 14	%Iγ=0.52 21
690.04 8	7.0 6	1446.01	(5)$^+$	755.91	3$^+$	(E2)		0.01077	%Iγ=1.41 15 α(K)=0.00851 12; α(L)=0.001738 25; α(M)=0.000409 6 α(N)=9.94×10^{-5} 14; α(O)=1.645×10^{-5} 23; α(P)=9.12×10^{-7} 13
726.22 8	2.21 12	1681.60	5$^-$	955.23	4$^+$	E1		0.00357	%Iγ=0.44 4 α(K)=0.00300 5; α(L)=0.000441 7; α(M)=9.99×10^{-5} 14 α(N)=2.43×10^{-5} 4; α(O)=4.16×10^{-6} 6; α(P)=2.98×10^{-7} 5
[x]739.73 10	3.8 2								%Iγ=0.76 6
768.57 8	10.7 8	955.23	4$^+$	186.69	2$^+$	E2		0.00853	%Iγ=2.15 20 α(K)=0.00682 10; α(L)=0.001318 19; α(M)=0.000309 5 α(N)=7.50×10^{-5} 11; α(O)=1.250×10^{-5} 18; α(P)=7.32×10^{-7} 11 combined intensity=17.0 10.

$^{190}_{76}Os_{114}$-6

$\gamma(^{190}Os)$ (continued)

E_γ[†]	I_γ[‡c]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	α[d]	Comments
828.99 *7*	2.6[a] *3*	1386.91	3^-	557.92	2^+	E1	0.00276	%Iγ=0.52 *7* α(K)=0.00232 *4*; α(L)=0.000339 *5*; α(M)=7.68×10^{-5} *11* α(N)=1.87×10^{-5} *3*; α(O)=3.20×10^{-6} *5*; α(P)=2.33×10^{-7} *4* combined intensity=55 *5*.
839.14 *12*	0.9[a] *1*	1386.91	3^-	547.88	4^+	(E1)	0.00270	%Iγ=0.181 *23* α(K)=0.00227 *4*; α(L)=0.000331 *5*; α(M)=7.50×10^{-5} *11* α(N)=1.82×10^{-5} *3*; α(O)=3.13×10^{-6} *5*; α(P)=2.27×10^{-7} *4* combined intensity=19.0 *9*.
864.85 *20*	3.1 *2*	2068.79	(5^+)	1203.82	5^+			%Iγ=0.62 *6*
881.10 *14*	3.9 *4*	1836.21	(6^+)	955.23	4^+			%Iγ=0.78 *9*
[x]889.07 *15*	2.2 *4*							%Iγ=0.44 *9*
905.75 *16*	6.5 *7*	2068.79	(5^+)	1163.10	4^+			%Iγ=1.31 *16*
952.3[f] *3*	0.81 *10*	1708.2?	$(2^+,3,4^+)$	755.91	3^+	(M1)		%Iγ=0.163 *22*
958.20 *14*	9.8 *6*	2121.28	$(5,6^+)$	1163.10	4^+			%Iγ=1.97 *16*
[x]965.1 *4*	2.1 *4*							%Iγ=0.42 *9*
1010.9[f] *3*	3.0 *4*	2061.2?	$(6^+,7^-)$	1050.43	6^+			%Iγ=0.60 *9*
1036.05[f] *20*	1.35 *14*	1583.84?	4^-	547.88	4^+	E1	0.00182	%Iγ=0.27 *4* α(K)=0.001539 *22*; α(L)=0.000222 *4*; α(M)=5.01×10^{-5} *7* α(N)=1.218×10^{-5} *17*; α(O)=2.10×10^{-6} *3*; α(P)=1.550×10^{-7} *22*
1113.6 *4*	2.0 *2*	2068.79	(5^+)	955.23	4^+			%Iγ=0.40 *5*
[x]1155.6 *5*	1.34 *17*							%Iγ=0.27 *4*
1166.1 *3*	2.03 *22*	2121.28	$(5,6^+)$	955.23	4^+			%Iγ=0.41 *5*
[x]1194.2 *3*	1.01 *10*							%Iγ=0.203 *23*
1200.24 *12*	0.34[a] *5*	1386.91	3^-	186.69	2^+	(E1)	1.42×10^{-3}	%Iγ=0.068 *11* α(K)=0.001184 *17*; α(L)=0.0001693 *24*; α(M)=3.82×10^{-5} *6* α(N)=9.30×10^{-6} *13*; α(O)=1.603×10^{-6} *23*; α(P)=1.196×10^{-7} *17*; α(IPF)=1.82×10^{-5} *3* combined intensity=7.5 *8*.
[x]1250.2 *4*	1.4 *3*							%Iγ=0.28 *7*
[x]1265.9 *5*	0.41 *12*							%Iγ=0.082 *25*
1313.1 *2*	3.2 *5*	2068.79	(5^+)	755.91	3^+			%Iγ=0.64 *11*
1324.30 *18*	1.07 *22*	1872.10	$(5)^-$	547.88	4^+	E1	1.25×10^{-3}	%Iγ=0.22 *5* α(K)=0.000997 *14*; α(L)=0.0001419 *20*; α(M)=3.20×10^{-5} *5* α(N)=7.80×10^{-6} *11*; α(O)=1.345×10^{-6} *19*; α(P)=1.010×10^{-7} *15*; α(IPF)=7.06×10^{-5} *10*
[x]1382.7 *5*	0.34 *12*							%Iγ=0.068 *25*
1386.95 *12*	0.14[a] *2*	1386.91	3^-	0.0	0^+	(E3)	0.00542	%Iγ=0.028 *5*

$^{190}_{76}Os_{114}$-7

$\gamma(^{190}$Os) (continued)

E_γ †	I_γ ‡c	E_i(level)	J^π_i	E_f	J^π_f	Comments
						α(K)=0.00434 *6*; α(L)=0.000818 *12*; α(M)=0.000191 *3* α(N)=4.66×10^{-5} *7*; α(O)=7.86×10^{-6} *11*; α(P)=5.00×10^{-7} *7*; α(IPF)=1.382×10^{-5} *20* combined intensity=3.1 *4*.
^{x}1499.4 *5*	0.25 *8*					%Iγ=0.050 *17*
1521.1 *4*	0.41 *12*	2068.79	(5$^+$)	547.88	4$^+$	%Iγ=0.082 *25*
^{x}1536.5 *8*	0.24 *7*					%Iγ=0.048 *15*
^{x}1564.9 *3*	0.59 *15*					%Iγ=0.12 *3*
^{x}1573.7 *3*	1.3 *3*					%Iγ=0.26 *7*
^{x}1616.4 *3*	0.70 *18*					%Iγ=0.14 *4*
^{x}1725.2 *5*	0.29 *9*					%Iγ=0.058 *19*
^{x}1745.4 *5*	0.20 *6*					%Iγ=0.040 *13*
^{x}1882.3 *7*	0.15 *5*					%Iγ=0.030 *11*
^{x}2023.4 *8*	0.10 *5*					%Iγ=0.020 *11*

† From 1974Ya02, obtained by the author from weighted averages when possible from their measurements of ^{190}Ir ε decay (11.78 d) and ^{190}Re β^- decay (3.2 h and 3.1 min).

‡ From decomposition (by evaluators) of the combined intensities given by 1974Ya02 for the 3.1-h (isomer) and 3.0-min (g.s.) activities in equilibrium, unless otherwise noted. Note that the combined intensities are quoted as for ^{190}Re isomer β^- decay in 1974Ya02 but are actually for the combination of two activities, with the ground state fed by the IT decays of ^{190}Re isomer in equilibrium. The combined intensities are given under comments for transitions seen in both activities. The quoted intensities for the β^- decay of the isomer decay here are obtained by removing the contributions from the b$^-$ decay of the g.s. that are already deduced first in the decomposition of combined intensities in the dataset of ^{190}Re β^- decay (3.0 m). See that dataset for how the decomposition is performed. The unplaced γ rays belong to ^{190}Re (3.0 min) and/or ^{190}Re (3.1 h), with quoted intensities being the original values in 1974Ya02. Intensity values in 1974Ya02 are relative to combined I(371.2γ)=100.

γ ray reported in ^{190}Ir ε decay (12 d) (1974Ya02). Iγ deduced from branching ratios in ^{190}Ir ε decay and Iγ value of the strongest branch from the parent level in this decay.

@ From intensity balance at 187 level. The corresponding combined intensity (3.1-h and 3.0-min in equilibrium) is 249 *5* from intensity balance using combined intensities for feeding transitions in 1974Ya02, but is inconsistent with the measured value of 310 *22* in 1974Ya02, The latter value is probably in error since it would imply a large β^- feeding to 187 level in the decay of ^{190}Re g.s. other than the 1387 level which is claimed to be the only level that is strongly fed in that decay in 1969Ha44 and 1974Ya02.

& Total Iγ=13.5 *8*. Iγ divided on the basis of branching ratio from ^{190}Ir ε decay (11.78 d).

[a] Deduced from the total I(γ+ce) to the 1387 level in this decay and the branching ratios from combined intensities, considering that the 1387 level is fed only by γ transitions from upper levels that are populated only in this decay. Those γ feedings account for a 4.6% *4* contribution to the population of the 1387 level in the decays of 3.1-h (isomer) and 3.0-min (g.s.) in equilibrium.

[b] From the Adopted Gammas.

[c] For absolute intensity per 100 decays, multiply by 0.201 *12*.

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

$^{190}_{76}$Os$_{114}$-8

γ(^{190}Os) (continued)

[e] Multiply placed with intensity suitably divided.
[f] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{190}Re β^- decay (3.1 h) 1974Ya02