^{190}Os IT decay (9.86 min) 1964Ha06,2012Kr05,1958Sc30

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}Os: E=1705.7 *1*; $J^{\pi}=(10)^{-}$; $T_{1/2}$=9.86 min *3*; %IT decay=100

1964Ha06: ^{190}Os isomer was from ε capture of the 3.1-h isomer of ^{190}Ir produced by proton irradiation of enriched ^{190}Os at ORNL. Conversion electrons were analyzed with photographic-recording, permanent-magnet spectrographs. Measured E(ce), I(ce). Deduced conversion sub-shell ratios.

2012Kr05: ^{190}Os isomer was produced via the reaction ^{189}Os(n,γ) with samples of Os of natural isotopic abundance irradiated with thermal and epithermal neutrons at Oregon State University TRIGA reactor. Measured Eγ, Iγ, half-life, σ using HPGe detector.

1958Sc30: ^{190}Os isomer was from ε capture of the 3.1-h isomer of ^{190}Ir produced by bombarding Os metal powder with 20-MeV deuterons at BNL. γ rays were detected with a NaI(Tl) detector and conversion electrons were detected with a Geiger counter. Measured Eγ, Iγ, $\gamma\gamma$-coin, E(ce), I(ce),

1977Au09: cross section for production of 9.9-min ^{190}Os from ^{192}Os(n,3n),E=16-18 MeV.

Others: 1968Da24, 1964Ti01, 1962Ma24, 1961Ma31, 1960Ka14.

$\gamma\gamma$(t): 1958Su57, 1958Be72.

^{190}Os Levels

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0	0^+		
186.720 *10*	2^+	0.35 ns *5*	$T_{1/2}$: from $\gamma\gamma$(t) in 1958Su57. Other: 0.5 ns *2* (1958Be72).
547.841 *18*	4^+	40 ps *20*	$T_{1/2}$: from $\gamma\gamma$(t) in 1958Su57.
1050.420 *20*	6^+		
1666.763 *25*	8^+		
1705.7 *1*	$(10)^-$	9.86 min *3*	$T_{1/2}$: from time variation of 4 γ lines (186.7, 361.1, 502.5, 616.3 keV) from ^{190m}Os decay, weighted average of 28 values (2012Kr05). Other: 9.1 m *1* (1958Sc30).

[†] From Eγ data.

[‡] From the Adopted Levels.

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$\gamma(^{190}Os)$

Quoted values of conversion-line intensities (given in sub-shell ratios under comments) from 1964Ha06 are normalized to 100 for 502.6γ ce(K) line. A 15% uncertainty has been assigned according to a general statement in 1964Ha06.

E_γ †	I_γ ‡@	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ	α&	$I_{(\gamma+ce)}$@	Comments
38.9 *1*	0.081 *3*	1705.7	$(10)^-$	1666.763	8^+	M2+E3	0.10 *2*	1.23×10^3 *11*	100	α(L)=9.1×10^2 *8*; α(M)=247 *23* α(N)=61 *6*; α(O)=9.8 *8*; α(P)=0.452 *7* (L1+L2)/L3=1.9 *4*; M/L=0.36 *4*; N/L=0.11 *3* (1958Sc30) E_γ: from energy of conversion lines (1964Ha06), seen in ce data only. Uncertainty is not available, but is estimated by evaluators as 0.1 keV. δ: deduced from L1:L2:L3:M in 1964Ha06 by evaluators using the BrIccMixing code. 1964Ha06 give mult=M2. L1:L2:L3:M=1200 180:270 41:750 113:750 113 (1964Ha06).
186.720 *10*	70.2 *3*	186.720	2^+	0.0	0^+	E2		0.420	100	α(K)=0.203 *3*; α(L)=0.1641 *23*; α(M)=0.0415 *6* α(N)=0.00996 *14*; α(O)=0.001502 *21*; α(P)=1.88×10^{-5} *3* K:L2:L3:M=875 131:375 56:275 41:220 33 (1964Ha06). I_γ: other: 73.1 *20* (2012Kr05).
361.121 *14*	94.92 *7*	547.841	4^+	186.720	2^+	E2		0.0535	100	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* E_γ: 361γ has small additional contribution from 361.9γ from ^{193}Os decay (2012Kr05). I_γ: other: 95.3 *15* (2012Kr05). K:L2:L3=215 32:50 8:15 2 (1964Ha06).
502.578 *10*	97.80 *3*	1050.420	6^+	547.841	4^+	E2		0.0225	100	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* K:L1=100:23 4 (1964Ha06). ce(L) line partially resolved (1964Ha06).
616.342 *15*	98.63 *2*	1666.763	8^+	1050.420	6^+	E2		0.01387	100	α(K)=0.01080 *16*; α(L)=0.00236 *4*; α(M)=0.000559 *8* α(N)=0.0001355 *19*; α(O)=2.23×10^{-5} *4*; α(P)=1.156×10^{-6} *17* E_γ: 616γ has small additional contribution from 616.8γ from ^{80m}Br decay (2012Kr05). I_γ: other: 99.4 *20* (2012Kr05). K:L1=62 9:13 2 (1964Ha06). ce(L) line partially resolved (1964Ha06).

$^{190}_{76}Os_{114}$-2

^{190}Os IT decay (9.86 min) 1964Ha06,2012Kr05,1958Sc30 (continued)

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

† From 2012Kr05.
‡ From 100/(1+α). Measured relative intensities from 2012Kr05 are given under comments, normalized to I(γ+ce)=100 for 502.6γ.
# From ce data in 1964Ha06 and 1958Sc30.
@ Absolute intensity per 100 decays.
& 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.

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

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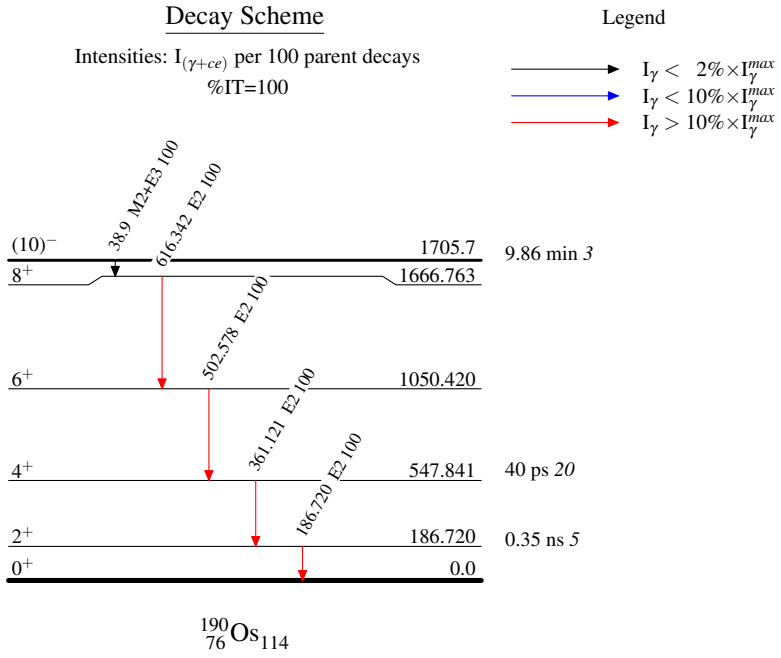

$^{190}_{76}Os_{114}$