

^{194}Os β^- decay (6.0 y) 1978In01,1965Jo10,1964Wi07

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 177, 1 (2021)	3-Sep-2021

Parent: ^{194}Os : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=6.0$ y 2; $Q(\beta^-)=96.6$ 20; $\% \beta^-$ decay=100.0

1978In01: ^{194}Os source was prepared by drop evaporation onto a thin mylar film. γ rays were detected with a large volume Ge(Li) detector and x rays were detected with a Si(Li) detector (FWHM=240 eV at 6.4 keV). Measured E_γ , I_γ , $E(\text{x ray})$, $I(\text{x ray})$. Deduced levels, J , π , conversion coefficients, multipolarity, β -decay branching ratios, log ft . 1978In01 deduce fluorescence yields also.

1965Jo10: ^{194}Os source was prepared by irradiation of a metallic Os in Oak Ridge LITR. γ and x rays were detected with a NaI spectrometer and electrons were detected with an anthracene detector. Measured E_γ , I_γ , $E(\text{x ray})$, $I(\text{x ray})$. Deduced levels, J , π , conversion coefficients, multipolarity, β -decay branching ratios, log ft .

1964Wi07: ^{194}Os source was prepared by irradiation of a natural Os metal with a thermal neutron flux from MTR. γ rays were detected with NaI(Tl) detectors. Conversion electrons were detected using a gas-flow proportional spectrometer. Measured E_γ , I_γ , $E(\text{ce})$, $I(\text{ce})$, $E\beta$, $I\beta$. Deduced levels, J , π , conversion coefficients, multipolarity, β -decay branching ratios, log ft . See also 1966Wi06.

1972KiZY: measured E_γ , I_γ , x rays.

1965He05: measured E_γ , I_γ , x rays, $E\beta$.

1951Li19: measured $T_{1/2}$ of ^{194}Os decay.

 ^{194}Ir Levels

<u>E(level)[†]</u>	<u>J^π[†]</u>
0.0	1^-
43.119 1	0^-
82.334? 1	1^-

[†] From Adopted Levels.

 β^- radiations

<u>E(decay)</u>	<u>E(level)</u>	<u>$I\beta^{-\ddagger\#}$</u>	<u>Log ft</u>	<u>Comments</u>
(14.3 [#] 20)	82.334?	<0.12	>7.4	av $E\beta=3.59$ 57
54.5 20	43.119	76 10	6.3 1	av $E\beta=13.71$ 53
				E(decay): from $\beta\gamma$ (1964Wi07). Other: 53 4 (1965Jo10).
				$I\beta^-$: others: 27 5 from $I(\gamma+\text{ce})/I\beta(\text{total})$ in 1964Wi07, 33 8 (1966Wi06), >95 from 1965Jo10 and 1965He05.
97 2	0.0	24 10	7.6 2	av $E\beta=25.13$ 55
				E(decay): from 1964Wi07. No such β^- component seen by 1965Jo10.
				$I\beta^-$: others: 73 5 (1964Wi07), 67 8 (1966Wi06), <5 (1965Jo10).

[†] From γ +ce intensity balance.

[‡] Absolute intensity per 100 decays.

[#] Existence of this branch is questionable.

$^{194}\text{Os } \beta^- \text{ decay (6.0 y) } \quad \text{1978In01,1965Jo10,1964Wi07 (continued)}$ $\gamma(^{194}\text{Ir})$

I γ normalization: From I γ (43 γ)/I γ (328 γ from ^{194}Ir decay)=0.413 7 (1978In01) and I(328 γ) per ^{194}Ir decay=0.131 17 (see ^{194}Ir β^- decay). From ce(L)(43 γ) and I β (total), 1964Wi07 deduce I(γ +ce)(43 γ)/I β =0.27 5. This ratio gives I γ normalization=0.019 4, which disagrees with that deduced from the γ -ray data (1978In01,1965Jo10,1965He05).

E_γ^\dagger	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	δ^\dagger	$\alpha^\#$	Comments
39.217 [@] 1	<0.07	82.334?	1 ⁻	43.119	0 ⁻	M1		16.66	%I γ <0.004 E γ , I γ : from Adopted Gammas, not observed in decay measurements in this dataset, with intensity deduced from γ -branching ratios in Adopted Gammas.
43.119 1	100	43.119	0 ⁻	0.0	1 ⁻	M1		12.8 3	%I γ =5.4 7 α (L)=9.85 20; α (M)=2.27 5 α (N)=0.558 11; α (O)=0.0988 20; α (P)=0.00743 15 E γ : others: 43.1 3 (1966Wi06), 42.8 2 (1964Wi07), and 43.0 4 (1965Jo10). Mult.: α (L)exp=12.1 from I γ (43 γ)/I(L x ray) (1978In01), α (L)exp=9.6 15 (1964Wi07), 9.2 9 (1965Jo10).
82.339 [@] 2	<0.2	82.334?	1 ⁻	0.0	1 ⁻	M1+E2	0.105 10	10.67	%I γ <0.011 α (K)=8.8 4; α (L)=1.46 6; α (M)=0.337 13 α (N)=0.083 4; α (O)=0.0147 6; α (P)=0.00110 5 E γ : others: 82.3 10 (1964Wi07), 82 1 (1966Wi06), 78 3 (1965Jo10). I γ : from 1978In01. 1964Wi07 give I γ =0.183 11 and 1965Jo10 give 0.32 8 for a 78 γ . No Ir K x ray observed by 1978In01 that is also consistent with the non-observation of 82.3 γ . It should be noted that 1978In01 incorrectly quote this limit as 0.002 in two places in the paper while it is correctly given as 0.2 in two other places. An examination of the spectrum shown by the authors clearly reveals the discrepant values. Mult.: M1 from ce data: I(K x ray)/I γ 1964Wi07 deduce α (K)exp=9.4 5; α (K)exp=5.6 12 from 1965Jo10.

[†] From Adopted Gammas. Supporting arguments from this dataset are given under comments where available.

[‡] For absolute intensity per 100 decays, multiply by 0.054 7.

[#] 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.

[@] Placement of transition in the level scheme is uncertain.

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