^{171}Os α decay (8.3 s) 2023Zh03,1995Hi02,1979Ha10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 191,1 (2023)	22-Aug-2023

Parent: ^{171}Os: E=0.0; J^π=(5/2$^-$); $T_{1/2}$=8.3 s *2*; Q(α)=5371 *4*; %α decay=1.80 *21*

^{171}Os-E,J^π: From ^{171}Os Adopted Levels in the ENSDF database (June 2018 update).

^{171}Os-$T_{1/2}$: Weighted average of 8.0 s *4* (2023Zh03, authors′ weighted average of 8.0 s *4* from 5248α, 8.5 s *12* from 5168α, 8.2 s *14* from 5115α); 8.4 s *2* (1995Hi02, authors′ weighted average of 8.3 s *2* from 5241α, 10.0 s *10* from 190γ, 8.0 s *24* from 705γ, and 8 s *2* from 5166α); 7.8 s *10* (1978Sc26); and 8.2 s *8* (1972To06). Same $T_{1/2}$ is given in ^{171}Os Adopted Levels in the ENSDF database (June 2018 update).

^{171}Os-Q(α): From 2021Wa16.

^{171}Os-%α decay: %α=1.80 *21* from ^{171}Os Adopted Levels in the ENSDF database (June 2018 update), where the value is adopted from 1.9% *3* in 1995Hi02 and 1.7% *3* in 1979Ha10.

2023Zh03: ^{171}Os produced in ^{92}Mo(^{83}Kr,2p2n),E(^{83}Kr)=383 MeV, followed by separation of fragments of interest using RITU in-flight separator at the University of Jyvaskyla cyclotron facility. The ^{171}Os nuclei and decay radiations were detected using GREAT spectrometer and JUROGAM II array of 15 Eurogam Phase I and 24 Euroball clover Compton-suppressed HPGe detectors. Measured Eα, Iα, Eγ, Iγ, $\alpha\gamma$-coin, α-branching ratios, K-conversion coefficients for γ rays, half-life of ^{171}Os decay. Deduced levels in ^{167}W, and α-hindrance factors.

1995Hi02: ^{171}Os from ^{140}Ce(^{36}Ar,5n). Measured Eα, Iα, Eγ, $\alpha\gamma$-coin, %α for ^{171}Os decay at the VICKSI accelerator facility of HMI-Berlin.

1979Ha10: ^{171}Os from ^{175}Pt parent α decay. Measured Eα, Iα using silicon surface-barrier detector with FWHM≈25 keV.

1996Pa01: measured Eα.

1978Sc26: measured Eα, half-life of ^{171}Os decay.

1972To06: measured Eα, half-life of ^{171}Os decay.

^{167}W Levels

E(level)†	J^π‡
0.0	(5/2$^-$)
79.2 *3*	(7/2$^-$)
134.2 *3*	(9/2$^-$)

† From Eγ values.

‡ From the Adopted Levels.

α radiations

Eα	E(level)	Iα†#	HF‡	Comments
5115 *4*	134.2	2.0 *6*	14 *8*	Eα: from 2023Zh03; 5115α in coin with 134.2γ and W K-x rays. This α line was not reported by 1995Hi02. HF: other: 6 *2* (2023Zh03).
5168 *4*	79.2	5.3 *9*	10 *4*	Eα: weighted average of 5168 keV *4* (2023Zh03) and 5166 keV *10* (1995Hi02). This α in coin with 79.2γ and W K-x rays (2023Zh03,1995Hi02). Iα: Other: 6.5 (1995Hi02). HF: other: 4.2 *7* (2023Zh03).
5246 *4*	0.0	92.7 *12*	1.36 *35*	Eα: weighted average of 5248 keV *4* (2023Zh03), 5248 keV *9* (1996Pa01), 5241 keV *7* (1995Hi02), 5267 keV *15* (1979Ha10), 5240 keV *10* (1978Sc26), and 5240 keV *10* (1972To06). Iα: Other: 93.5 (1995Hi02). HF: other: 1.1 *1* (2023Zh03).

† Deduced by evaluators from data in (2023Zh03) relative to %Iα=1.68 *18* for 5246α (value taken by 2023Zh03 from ^{171}Os α

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^{171}Os α decay (8.3 s) 2023Zh03,1995Hi02,1979Ha10 (continued)

α radiations (continued)

decay dataset in the ENSDF database of June 2018).

‡ The nuclear radius parameter $r_0(^{167}W)$=1.572 *10* is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides in 2020Si16.

For absolute intensity per 100 decays, multiply by 0.0180 *21*.

$\gamma(^{167}W)$

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α #	$I_{(\gamma+ce)}$ ‡	Comments
79.2 *3*	0.52 *8*	79.2	(7/2$^-$)	0.0	(5/2$^-$)	M1	9.27 *17*	5.3 *9*	α(K)=7.68 *14*; α(L)=1.234 *22*; α(M)=0.281 *5*; α(N)=0.0677 *12* α(O)=0.01104 *20*; α(P)=0.000784 *10* E_γ: other: 79 (1995Hi02). Mult.: from α(K)exp=9.0 *11* (2023Zh03, from Iγ and I(K x-rays)). Other: α(K)exp≈10 from $\alpha\gamma$-coin (1995Hi02). $I_{(\gamma+ce)}$: from Iα for 5168α. I_γ: based on I(γ+ce)=Iα and α.
134.2 *3*	0.88 *25*	134.2	(9/2$^-$)	0.0	(5/2$^-$)	E2	1.261 *12*	2.0 *6*	α(K)=0.473 *7*; α(L)=0.597 *11*; α(M)=0.150 *3*; α(N)=0.0355 *7* α(O)=0.00490 *9*; α(P)=3.55×10^{-5} *6* Mult.: from α(K)exp=0.39 *8* (2023Zh03). $I_{(\gamma+ce)}$: from Iα for 5115α. I_γ: based on I(γ+ce)=Iα and α.

† From 2023Zh03.

‡ For absolute intensity per 100 decays, multiply by 0.0180 *21*.

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.

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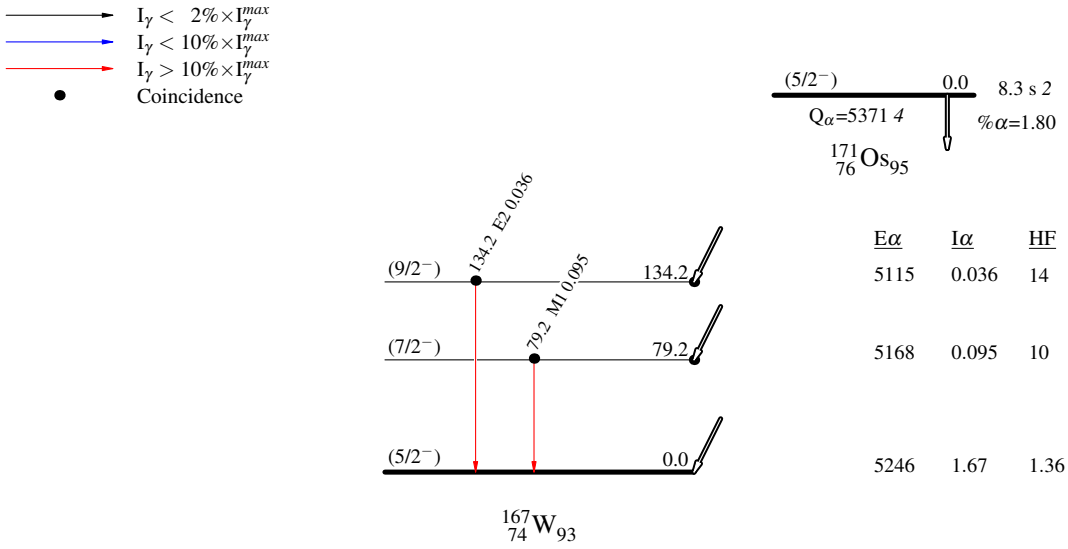
Decay Scheme

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



Eα	Iα	HF
5115	0.036	14
5168	0.095	10
5246	1.67	1.36