^{164}Ta ε decay (14.2 s) 1989Hi04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen#	NDS 147, 1 (2018)	30-Nov-2017

Parent: ^{164}Ta: E=0; J$^{\pi}$=(3^{+}); T$_{1/2}$=14.2 s *3*; Q(ε)=8540 *30*; %ε+%β^{+} decay=100.0

^{164}Ta-J$^{\pi}$,T$_{1/2}$: From ^{164}Ta Adopted Levels.

^{164}Ta-Q(ε): From 2017Wa10.

1989Hi04 (also 1986Ru05): Measured Eγ, Iγ, γγ coin, T$_{1/2}$. The assignment of γ radiation to tantalum decays was performed by coincidence measurements with HF K x ray rays following ε decay and/or internal conversion.

Others:

1982Ei03 (also 1989Br19): Measured Eγ, Iγ, T$_{1/2}$.

1982Li17: Measured Eγ, Iγ, T$_{1/2}$. Two γ rays reported at 210.7 and 376.5 keV.

1983Sc18: Measured Eα, Eγ, Iγ, T$_{1/2}$. Two γ rays reported at 211.05 (100) and 376.8 (25). Eα=4625 *15*.

1992Ha10: Measured Eγ, Iγ, T$_{1/2}$, Eα, Iα. Five γ rays are reported with energies and intensities.

The decay scheme is considered by the evaluators as incomplete.

^{164}Hf Levels

E(level)†	J$^{\pi}$‡	E(level)†	J$^{\pi}$‡	E(level)†	J$^{\pi}$‡	E(level)†
0.0	0^{+}	620.2 *8*		1237.7 *11*		1486.2 *11*
210.7 *3*	2^{+}	816.0 *4*	(2^{+})	1352.6 *6*	(2^{+},3,4^{+})	1614.0 *9*
587.2 *4*	4^{+}	1072.5 *5*	(2^{+},3,4^{+})	1458.0 *11*		1675.7 *9*

† From least-squares fit to Eγ data.

‡ From Adopted Levels.

ε,β^{+} radiations

E(decay)	E(level)	Iβ^{+} ‡	Iε‡	Log *ft*†	I(ε+β^{+})†‡	Comments
(6.86×10^{3} *3*)	1675.7	2.1	0.45	6.4	2.6	av Eβ=2680 *16*; εK=0.1441 *20*; εL=0.0227 *4*; εM+=0.00692 *10*
(6.93×10^{3} *3*)	1614.0	2.0	0.41	6.4	2.4	av Eβ=2709 *16*; εK=0.1406 *20*; εL=0.0222 *3*; εM+=0.00675 *10*
(7.05×10^{3} *3*)	1486.2	2.0	0.39	6.5	2.4	av Eβ=2769 *16*; εK=0.1336 *18*; εL=0.0211 *3*; εM+=0.00642 *9*
(7.08×10^{3} *3*)	1458.0	3.1	0.59	6.3	3.7	av Eβ=2783 *16*; εK=0.1322 *18*; εL=0.0208 *3*; εM+=0.00634 *9*
(7.19×10^{3} *3*)	1352.6	7.5	1.4	5.9	8.9	av Eβ=2833 *17*; εK=0.1268 *17*; εL=0.0200 *3*; εM+=0.00609 *9*
(7.30×10^{3} *3*)	1237.7	2.8	0.48	6.4	3.3	av Eβ=2887 *17*; εK=0.1213 *16*; εL=0.0191 *3*; εM+=0.00582 *8*
(7.47×10^{3} *3*)	1072.5	8.0	1.3	6.0	9.3	av Eβ=2966 *17*; εK=0.1139 *15*; εL=0.01795 *24*; εM+=0.00546 *8*
(7.72×10^{3} *3*)	816.0	16	2.2	5.8	18	av Eβ=3087 *17*; εK=0.1034 *14*; εL=0.01629 *21*; εM+=0.00496 *7*
(7.92×10^{3} *3*)	620.2	1.9	0.26	6.8	2.2	av Eβ=3181 *17*; εK=0.0963 *12*; εL=0.01516 *19*; εM+=0.00461 *6*
(7.95×10^{3} *3*)	587.2	14	1.8	5.9	16	av Eβ=3196 *17*; εK=0.0951 *12*; εL=0.01498 *19*; εM+=0.00456 *6*
(8.33×10^{3} *3*)	210.7	28	3.1	5.7	31	av Eβ=3376 *17*; εK=0.0832 *10*; εL=0.01310 *16*; εM+=0.00398 *5*

† All feedings and log *ft* values should be treated as approximate since there is a gap of≈6.8 MeV between the Q(β^{-}) value and highest level shown in the present decay scheme.

‡ Absolute intensity per 100 decays.

^{164}Ta ε decay (14.2 s) 1989Hi04 (continued)

$\gamma(^{164}Hf)$

Iγ normalization: Ti(210.7γ+815.7γ)=100. No $\varepsilon+\beta^+$ feeding is assumed to the ground state of ^{164}Hf. Due to large gap of about 6.8 MeV between Q(β^-) and levels in ^{164}Hf shown here, the normalization should be treated as approximate.

E_γ	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [†]	α [#]	Comments
210.7 *3*	74.0 *22*	210.7	2^+	0.0	0^+	E2	0.242	α(K)=0.1447 *21*; α(L)=0.0740 *12*; α(M)=0.0181 *3* α(N)=0.00422 *7*; α(O)=0.000556 *9*; α(P)=9.60×10^{-6} *14* E_γ: other: 211.05 *5* (1983Sc18). I_γ: from I(γ+ce)=92.0 *10* (1989Hi04) and α.
376.4[‡] *3*	20.4[‡] *20*	587.2	4^+	210.7	2^+	E2	0.0411	α(K)=0.0302 *5*; α(L)=0.00832 *12*; α(M)=0.00198 *3* α(N)=0.000464 *7*; α(O)=6.45×10^{-5} *10*; α(P)=2.24×10^{-6} *4* E_γ: other: 376.8 *1* (1983Sc18). I_γ: average of 22.0 *20* (from I(γ+ce)=23.0 *20* (1989Hi04)) and 18.6 *21* (1992Ha10).
409.5 *7*	2.2 *3*	620.2		210.7	2^+			
485 *1*	1.7 *5*	1072.5	$(2^+,3,4^+)$	587.2	4^+			
541.5 *5*	2.4 *6*	1614.0		1072.5	$(2^+,3,4^+)$			
605.2[‡] *4*	14.1[‡] *10*	816.0	(2^+)	210.7	2^+			Additional information 1.
642 *1*	4.1 *6*	1458.0		816.0	(2^+)			
650.5 *10*	3.3 *5*	1237.7		587.2	4^+			
765 *1*	1.9 *5*	1352.6	$(2^+,3,4^+)$	587.2	4^+			
816.0[‡] *4*	8.4[‡] *10*	816.0	(2^+)	0.0	0^+			
861.8[‡] *4*	10.3[‡] *5*	1072.5	$(2^+,3,4^+)$	210.7	2^+			
1142.0 *5*	7.0 *4*	1352.6	$(2^+,3,4^+)$	210.7	2^+			
1275.5 *10*	2.4 *5*	1486.2		210.7	2^+			
1465.0 *8*	2.6 *7*	1675.7		210.7	2^+			

† From Adopted Gammas.
‡ Weighted averages of 1989Hi04 and 1992Ha10.
\# Additional information 2.
@ Absolute intensity per 100 decays.

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Decay Scheme

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