

$^{174}\text{Er } \beta^-$ decay **1991Be04,1989Ch05**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, Huo Junde		NDS 87, 15 (1999)	1-Nov-1998

Parent: ^{174}Er : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=3.2$ min 2; $Q(\beta^-)=2.0\times 10^3$; $\% \beta^-$ decay=100.0

Activity produced by bombarding targets of tungsten and tantalum with ^{176}Yb ($E=1.5$ GeV) projectiles. Mass separated ^{174}Er .

Measured β^- , γ -ray energies and intensities, coincidences, Tm K-x rays (**1991Be04,1989Ch05**).

^{174}Er partial decay scheme is tentative. Direct β^- population to levels at 767 and 773 from ^{174}Er ($J^\pi=0^+$) is inconsistent with γ -ray decay from these levels to ^{174}Tm ($J^\pi=(4)^-$) g.s., which suggests the existence of a very low-energy level with $J\leq 2$ (**1991Be04**).

Measured $E\beta\approx 1.3$ MeV (**1989Ch05**).

 ^{174}Tm Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	$(4)^-$	5.4 min 1	$J^\pi, T_{1/2}$: from Adopted Levels.
0.0+x	0,1,2		β^- population could be significant (1991Be04).
58.5+x			β^- population could be significant (1991Be04).
100.4+x			
130.4+x			
252.2+x			a 121.8-keV γ ray ($I_\gamma=39$ %) was observed by 1989Ch05 , but not by 1991Be04 ($I_\gamma\leq 5$).
766.9+x			
772.9+x			

 β^- radiations

E(decay)	E(level)	$I\beta^{-\dagger}$	Log ft	Comments
$(6\times 10^{2\ddagger} \ 6)$	772.9+x	≈ 18	5.2	av $E\beta=427.53$
$(6\times 10^{2\ddagger} \ 6)$	766.9+x	≈ 23	5.1	av $E\beta=429.98$
$(9\times 10^{2\ddagger} \ 9)$	252.2+x	≈ 15	5.8	av $E\beta=646.34$
$(9\times 10^{2\ddagger} \ 9)$	130.4+x	≈ 13	6.0	av $E\beta=698.90$
$(9\times 10^{2\ddagger} \ 10)$	100.4+x	≈ 31	5.7	av $E\beta=711.90$

$\dagger$ Absolute intensity per 100 decays.

$\ddagger$ Estimated for a range of levels.

 $\gamma(^{174}\text{Tm})$

I_γ normalization: Assuming no β^- population to levels at 58.5 keV and below, and using $I_\gamma(58.5\gamma + 100.4\gamma + 130.4\gamma + 766.5\gamma + 773.4\gamma)=100\%$.

$E_\gamma^\dagger$	$I_\gamma^\#$	$E_i(\text{level})$	E_f	J_f^π	Mult.	δ	Comments
58.5 2		58.5+x	0.0+x	0,1,2			Observed only in a coincidence experiment (1989Ch05). Not observed by 1991Be04 ($I_\gamma\leq 45$, estimated from K x ray intensities).
71.7 2	$12^\ddagger \ 4$	130.4+x	58.5+x		(E2)		M1 or E2, from K x ray intensity (1991Be04).
100.4 2	$100^\dagger \ 1$	100.4+x	0.0+x	0,1,2	M1+E2	$1.2 +7-4$	Mult., δ : deduced by evaluator from $\alpha(\text{K})\text{exp}=1.7 \ 3$ (1991Be04).
130.4 2	$43^\dagger \ 4$	130.4+x	0.0+x	0,1,2	(M1)		M1 or E2, from K x ray intensity (1991Be04).

Continued on next page (footnotes at end of table)

$^{174}\text{Er} \beta^-$ decay [1991Be04](#), [1989Ch05](#) (continued) $\gamma(^{174}\text{Tm})$ (continued)

E_γ [†]	I_γ [#]	$E_i(\text{level})$	E_f	J_f^π	Mult.	δ	Comments
151.9 2	80 [†] 8	252.2+x	100.4+x		M1+E2	1.2 +4-3	Mult., δ : deduced by evaluator from $\alpha(\text{K})\text{exp}=0.54$ 6 (1991Be04).
636.7 2	44 [‡] 17	766.9+x	130.4+x				
642.7 2	25 [†] 2	772.9+x	130.4+x				
708.4 2	75 [‡] 18	766.9+x	58.5+x				
714.4 2	49 [‡] 7	772.9+x	58.5+x				
766.9 2	95 [†] 5	766.9+x	0.0+x	0,1,2			
772.9 2	87 [‡] 13	772.9+x	0.0+x	0,1,2			

[†] Weighted average of values from [1991Be04](#) and [1989Ch05](#).

[‡] Unweighted average ($\chi^2 > 1$) of values from [1991Be04](#) and [1989Ch05](#).

[#] For absolute intensity per 100 decays, multiply by ≈ 0.11 .

$^{174}\text{Er} \beta^- \text{ decay}$ 1991Be04,1989Ch05

Decay Scheme

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

Legend

- $I_{\gamma} < 2\% \times I_{\gamma}^{\max}$
- $I_{\gamma} < 10\% \times I_{\gamma}^{\max}$
- $I_{\gamma} > 10\% \times I_{\gamma}^{\max}$

