^{173}Tm β^- decay 1963Or01,1966Ha23

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

Parent: ^{173}Tm: E=0.0; J^π=(1/2$^+$); $T_{1/2}$=8.24 h *8*; Q(β^-)=1298 *5*; %β^- decay=100.0

The decay scheme and most data are from 1963Or01 and 1966Ha23.

1963Or01: sources from ^{174}Yb(γ,p) (E$\gamma\geq$23 MeV), ^{173}Yb(n,p) (E(n)=14.8 MeV), ^{170}Er(α,p) (Eα=26 MeV); measured Eγ, Iγ, Eβ, Iβ (scin), prompt and delayed Xγ, $\gamma\gamma$, $\beta\gamma$ coin.

1966Ha23: sources from ^{176}Yb(p,α) (E(p)=20 MeV); measured E(ce), Ice (mag spect, resolution=0.1%).

Some data are from 1967BlZY and 1969BoZP. Others: 1961Ku10, 1963Ku22.

^{173}Yb Levels

Band structure: see Adopted Levels.

E(level)	J^π	$T_{1/2}$	Comments
0.0	5/2$^-$	stable	
398.9 *5*	1/2$^-$	2.9 μs *1*	$T_{1/2}$: weighted average of 3.50 μs *25* ($\beta\gamma$(t), 1963Or01), 2.91 μs *9* ($\beta\gamma$(t), 1967BlZY), and 2.80 μs *15* ($\gamma\gamma$(t), γce(t), 1969BoZP). Other: 1963Ku22.
461.5 *5*	3/2$^-$	0.56 ns *3*	$T_{1/2}$: $\beta\gamma$(t) (1967BlZY).

β^- radiations

Excited-state β^- feedings are from intensity imbalance at each level; g.s. feeding (≈2%) is from 1963Or01.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(837 *5*)	461.5	22 *6*	6.70 *15*	av Eβ= 272.4 *19*
(899 *5*)	398.9	76 *6*	6.27 *4*	av Eβ= 296.4 *19*
1320 *60*	0.0	≈2	≈9.1[1*u*]	av Eβ= 455.3 *20* E(decay): from 1963Or01.

[†] Absolute intensity per 100 decays.

$\gamma(^{173}Yb)$

Iγ normalization: from total I(γ+ce) to g.s.=98% 1 (β^- feeding to g.s.≈2% (1963Or01)).

E$_\gamma$[†]	I$_\gamma$[‡#]	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	δ	α[@]	Comments
62.6 *2*	1.0 *4*	461.5	3/2$^-$	398.9	1/2$^-$	M1+E2	0.54 *3*	15.4	α(K)= 9.05; α(L)= 4.84; α(M)= 1.16; α(N+..)= 0.319 Mult.,δ: from L1:L2:L3=7.1 *7*:10 *1*:10 (1966Ha23). M1+E2 (with δ=0.54) is also consistent with α(K)exp=9.0 *7* (1963Or01) and α(L)exp=4.7 *20* (1966Ha23).
398.9 *6*	100	398.9	1/2$^-$	0.0	5/2$^-$	E2		0.0326	α(K)= 0.0247; α(L)= 0.00607; α(M)= 0.00141; α(N+..)= 0.000426 Mult.: from K:(L1+L2):L3:M=100:20 *4*:5.5 *11*:6 *1* (1966Ha23).
461.4 *8*	7.8 *3*	461.5	3/2$^-$	0.0	5/2$^-$	M1		0.0517	α(K)= 0.0434; α(L)= 0.00643; α(M)= 0.00143; α(N+..)= 0.000436

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^{173}Tm β^- decay 1963Or01,1966Ha23 (continued)

$\gamma(^{173}Yb)$ (continued)

E_γ [†]	E_i(level)	Comments
		Mult.: from α(K)exp=0.047 *7*, as deduced from Iγ and Ice, normalized through α(K)=0.0247 (E2 theory) for 398.9γ. E3 is precluded by high L1/(L2+L3) ratio (1966Ha23).

† From 1966Ha23.
‡ From 1967BlZY.
# For absolute intensity per 100 decays, multiply by 0.879 *9*.
@ 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