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^{158}Yb ε decay   1976Gi15,1980Al14,1990AbZW

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	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	N. Nica	NDS 141, 1 (2017)	1-Feb-2017

Parent: ^{158}Yb: E=0.0; J^π=0$^+$; $T_{1/2}$=1.49 min 13; Q(ε)=2693 26; %ε+%β^+ decay=100.0

Sources produced by spallation of Ta with 660-MeV protons followed by mass separation.

With a Q value of 2730 keV, the evaluator assumes that the present decay scheme is very incomplete.

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^{158}Tm Levels

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E(level)	$J^{\pi\dagger}$	$T_{1/2}^{\ddagger}$	Comments
0.0	2$^-$	3.98 min 6	$T_{1/2}$: from Adopted Levels.
74.10 10	(1)$^+$	1.74 ns 4	J^π: 1$^+$,2$^+$,3$^+$ from E1 γ to 2$^-$; 2$^+$,3$^+$ less likely from estimated strong population in ε decay from 0$^+$ of ^{158}Yb parent (see comment on normalization).

† From ^{158}Tm Adopted Levels.

‡ From 1990AbZW (γ(t)) unless noted otherwise.

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ε,β^+ radiations

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E(decay)	E(level)	I$\beta^{+\dagger}$	I$\varepsilon^\dagger$	Log ft	I($\varepsilon+\beta^+$)†	Comments
(2.62×10^3 3)	74.10					av Eβ=724 12
(2.69×10^3 3)	0.0	<0.008	<0.2	>8.1^{1u}	<0.2	av Eβ=765 12; εK=0.7923 18; εL=0.1289 4; εM+=0.03892 12 I($\varepsilon+\beta^+$): Limit is from β-decay systematics (1998Si17) for masses >125.

† Absolute intensity per 100 decays.

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$\gamma(^{158}$Tm)

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Iγ normalization: because the level scheme is vastly unknown the normalization cannot be properly estimated so no value is adopted. However if one allows for feeding of the ground state by the observed, but unplaced, γ's, and feeding of the 74-keV level by observed, but unplaced γ's, then about 94% of the decays would feed the 74-keV level (which gives a normalization factor of about 0.54).

E$_\gamma^\ddagger$	I$_\gamma^\ddagger$	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	$\alpha^\dagger$	Comments
74.1 1	100	74.10	(1)$^+$	0.0	2$^-$	E1	0.731	α(K)=0.599 9; α(L)=0.1030 15; α(M)=0.0230 4 α(N)=0.00525 8; α(O)=0.000681 10; α(P)=2.56×10^{-5} 4 Mult.: From measured α(K)exp = I$_{Kx}$/I$_\gamma$ = 1.5 5 (1976Gi15) with estimated contribution to I$_{Kx}$ from ε decay.
^{x}147.7 1	1.7 4							
^{x}160.3 1	2.1 4							
^{x}252.6 2	3.3 6							

† Additional information 1.

‡ From 1980Al14.

^{x} γ ray not placed in level scheme.

^{158}**Yb** ε **decay**   **1976Gi15,1980Al14,1990AbZW**

Decay Scheme

Intensities: Relative I$_\gamma$

0^+ 0.0   1.49 min *13*

$\%\varepsilon + \%\beta^+ = 100.0$ Q$_\varepsilon$=2693 *26*

$_{70}^{158}\text{Yb}_{88}$

	Iβ^+	Iε	Log ft

$(1)^+$ 74.1 E1 100   74.10   1.74 ns *4*

2^- 0.0   3.98 min *6*   <0.008   <0.2   >8.1^{1u}

$_{69}^{158}\text{Tm}_{89}$