

^{151}Ho α decay (47.2 s) 1995Wa31,1991To08,1987Li09

Type	Author	Citation	History	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181,1 (2022)		9-Mar-2022

Parent: ^{151}Ho : $E=41.0$ 2; $J^\pi=(1/2^+)$; $T_{1/2}=47.2$ s 13; $Q(\alpha)=4695.0$ 18; $\% \alpha$ decay=80 18

^{151}Ho - $Q(\alpha)$: from 2021Wa16.

^{151}Ho - $\% \alpha$ decay: adopted by 2009Si01 from $\% \alpha=80 +15-20$ (1991To08). Others (quoted by 2009Si01): 47 8 (1990Po13), >40 (1982Ba75), 19 4 (1974Sc19), 28 +28-14 (1963Ma17).

1995Wa31: 660-MeV protons on W at ISOL/YASNAPP-2 (JINR Dubna); used Si(Au) and HPGe detectors with disk transport; measured $E\alpha$, $I\alpha$, $\alpha\gamma$.

1991To08: 291-MeV (273-MeV at target midpoint) ^{64}Zn on ^{95}Mo (98.8%) followed by α and ε decays; used Si ΔE -E, HPGe, 1-mm-thick plastic scintillator, n-type Ge detectors with tape transport; measured $E\gamma$, $I\gamma$, $E\alpha$, $I\alpha$, $\gamma\gamma$.

1987Li09: 280-MeV ^3He on Tb at ISOCELE II mass separator (Orsay); used Ge(Li) and Si surface barrier detectors with tape transport; measured $\alpha\gamma$, $\gamma\gamma$. Also $^{96}\text{Mo}(^{58}\text{Ni},3p)$ at GSI; supersedes 1987LiZU.

Others: 1990Po13 ($E\alpha$, $I\alpha$), 1988ScZV ($\alpha\gamma$), 1982Ba75 ($E\gamma$, $I\gamma$, deduced $^{151}\text{Ho}^m$ α branching), 1982Bo04 ($E\alpha$), 1974Sc19 ($E\alpha$, $I\alpha$, $E\gamma$, deduced $^{151}\text{Ho}^m$ α branching), 1963Ma17 ($E\alpha$, $T_{1/2}$).

 ^{147}Tb Levels

E(level) [†]	J^π [‡]	$T_{1/2}$ [‡]	Comments
0.0	(1/2 ⁺)	1.64 h 3	$\% \varepsilon + \% \beta^+ = 100$ $\% \varepsilon + \% \beta^+$: adopted value.
50.6 9	(11/2 ⁻)	1.83 min 6	$\% \varepsilon + \% \beta^+ = 100$ $\% \varepsilon + \% \beta^+$: adopted value.
253.4	(3/2 ⁺)	<1.3 ns	
354.1	(5/2 ⁺)	<2 ns	

[†] Established by 1987Li09 from $\alpha\gamma$ study of ^{151}Ho and ^{147}Tb .

[‡] Adopted values.

 α radiations

$E\alpha$ [†]	E(level)	$I\alpha$ [#]	HF [‡]	Comments
4256	354.1	0.235 12	8.7 21	$E\alpha$: 4260 (1987Li09), 4265 (1995Wa31). $I\alpha$: 0.236 12, weighted average (external) of 0.23 1 (1995Wa31) and 0.26 2 (1987Li09), multiplied by 0.9976 for converting to $I\alpha$ per 100 decays through this decay branch.
(4357)	253.4	<0.02	>291	$I\alpha$: from 1995Wa31; other: <0.05 (1987Li09).
(4562)	50.6	<0.06	>1183	$E\alpha$: 4558 (1987Li09), 4565 (1995Wa31). $I\alpha$: from 1995Wa31; other: <1.1 (1987Li09).
4610.6 22	0.0	99.8	1.7	$E\alpha$: from evaluation by 1991Ry01. Others: $E=4604$ (1987Li09), 4607 (1991To08); observed by 1995Wa31, who quote $E\alpha=4611$ (weighted average of values from 1991Ry01), and by 1987Li09 who quote $E\alpha=4604$ as from 1979Ry03 (actually this corresponds to the average of unadjusted values considered by 1979Ry03). $I\alpha$: 100 from 1995Wa31 and 1987Li09, multiplied by 0.9976 for converting to $I\alpha$ per 100 decays through this decay branch.

[†] Values in parentheses: calculated from $Q(\alpha)$ and E(level).

[‡] The nuclear radius parameter $r_0(^{147}\text{Tb})=1.5642$ 20 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides.

[#] For absolute intensity per 100 decays, multiply by 0.80 18.

¹⁵¹Ho α decay (47.2 s) 1995Wa31,1991To08,1987Li09 (continued)

γ(¹⁴⁷Tb)

<u>E_γ</u>	<u>E_i(level)</u>	<u>J^π_i</u>	<u>E_f</u>	<u>J^π_f</u>	<u>Comments</u>
100.7	354.1	(5/2 ⁺)	253.4	(3/2 ⁺)	E _γ : from 1995Wa31 and 1987Li09.
253.4	253.4	(3/2 ⁺)	0.0	(1/2 ⁺)	E _γ : from 1995Wa31 and 1987Li09.

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Decay Scheme

