
 ^{164}Ho IT decay (36.6 min) [1999IsZZ](#),[1973KaZW](#),[1966Jo07](#)

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

Parent: ^{164}Ho : E=139.77 8; $J^\pi=6^-$; $T_{1/2}=36.6$ min 3; %IT decay=100.0

 ^{164}Ho Levels

$T_{1/2}$ measurements: [2008Ha21](#), [1972Dr04](#), [1972Ka19](#), [1971Pa02](#), [1968Bo25](#), [1966Jo07](#), [1966Se07](#).

E(level) [†]	J^π [‡]	$T_{1/2}$ [‡]	Comments
0.0	1 ⁺	29 min 1	
37.34 2	2 ⁺	≤ 2.8 ns	$T_{1/2}$: $\gamma\gamma(t)$ (1965Hu02).
93.98 6	3 ⁺		
139.77 8	6 ⁻	36.6 min 3	

[†] From E γ data.

[‡] From Adopted Levels.

$\gamma(^{164}\text{Ho})$

I_γ normalization: Ti(37.34γ+94.00γ)+Ti(56.64γ+94.00γ)+Ti(45.79γ)=300.

E_γ [‡]	I_γ ^{#&}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	$\delta^\dagger$	α^b	$I_{(\gamma+ce)}$ ^{@a}	Comments
37.34 2	30.8 16	37.34	2 ⁺	0.0	1 ⁺	M1+E2	0.045 +12-8	7.8 3	100	$\alpha(\text{L})=6.10$ 20; $\alpha(\text{M})=1.35$ 5 $\alpha(\text{N})=0.314$ 11; $\alpha(\text{O})=0.0450$ 13; $\alpha(\text{P})=0.00241$ 4 ce: L1:L2:L3=170 17:18 2:7.0 10 (1999IsZZ). Others: (L1+L2):L3:M=100:5.3:25 (1966Jo07), $2<\alpha(\text{L})\text{exp}<15$ (1954Br96). δ : from %E2=0.20 +12-6 in 1999IsZZ from their measured L-subshell ratios. BrIccMixing gives $\delta=0.041$ +7-6, using L1/L2, L1/L3 and L2/L3 from 1999IsZZ .
45.79 6	0.059 3	139.77	6 ⁻	93.98	3 ⁺	E3		4.53×10 ³	100	$\alpha(\text{L})=3.38\times 10^3$ 6; $\alpha(\text{M})=914$ 15 $\alpha(\text{N})=208$ 4; $\alpha(\text{O})=23.3$ 4; $\alpha(\text{P})=0.01321$ 21 I _γ : from I(γ+ce), α and I _γ normalization. ce: L1:L2:L3=<2:100 10:110 11 (1999IsZZ). Others: (L1+L2):L3:M:N=100:108:49:15 (1966Jo07), L:M=2 (1954Br96).
56.64 5	17.6 9	93.98	3 ⁺	37.34	2 ⁺	M1+E2	0.052 11	14.2 7	99.37 8	$\alpha(\text{K})\text{exp}=12.0$ 7; $\alpha(\text{L})=1.75$ 4; $\alpha(\text{M})=0.388$ 8; $\alpha(\text{N})=0.090$ 18 $\alpha(\text{O})=0.01299$ 24; $\alpha(\text{P})=0.000707$ 10 $\alpha(\text{K})\text{exp}=12.0$ 7 (1974Vi05); $\alpha(\text{K})\text{exp}=12.3$ 5 (1973KaZW) ce: L1:L2:L3=28 3:3.1 4:1.2 2 (1999IsZZ). Others: (L1+L2):L3>5 and (L1+L2):M=2.9 (1966Jo07). I _(γ+ce) : 100-I(γ+ce)(94γ). δ : from %E2=0.27 12 in 1999IsZZ from their measured L-subshell ratios. BrIccMixing gives $\delta=0.065$ 10, using L1/L2 and L1/L3 from 1999IsZZ , inclusion of L2/L3 gives $\delta=0.086$ 12, but with reduced $\chi^2=3.4$. $\alpha(\text{K})=1.272$ 18; $\alpha(\text{L})=1.76$ 3; $\alpha(\text{M})=0.425$ 6 $\alpha(\text{N})=0.0957$ 14; $\alpha(\text{O})=0.01133$ 17; $\alpha(\text{P})=5.27\times 10^{-5}$ 8 ce: L2:L3:M=0.3 1:0.3 1:≈0.2 (1999IsZZ). I _(γ+ce) : from I _γ , α and γ-normalization factor.
94.00 5	0.37 4	93.98	3 ⁺	0.0	1 ⁺	E2		3.56	0.63 8	

[†] From ce data of [1999IsZZ](#). Mixing ratios are from %E2 components given in [1999IsZZ](#).

[‡] From [1999IsZZ](#). Others: [1973KaZW](#), [1954Br96](#), [1966Se07](#), [1966Jo07](#), [1969Ha56](#), [1970St01](#), [1971Pa02](#), [1972Dr04](#).

[#] Normalized to I(Kα₁ x ray of Ho)=100 ([1973KaZW](#)). Other I_γ measurements: [1972Dr04](#), [1972Ka19](#), [1971Pa02](#), [1966Se07](#), [1966Jo07](#), [1954Br96](#).

[@] [Additional information 1](#).

[&] For absolute intensity per 100 decays, multiply by 0.371 13.

^a Absolute intensity per 100 decays.

^b 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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