^{162}Ho IT decay (67.0 min) 1999IsZZ

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 195,1 (2024)	19-Sep-2023

Parent: ^{162}Ho: E=105.87 *6*; J^π=6$^-$; $T_{1/2}$=67.0 min *7*; %IT decay≈63

^{162}Ho-%IT decay: from evaluator's analysis based on Ice(L)(38.34)/Ice(K)(184.99) ratio measured by 1961Jo10, with 38.34γ in ^{162}Ho IT decay (67 min) scheme and 184.99γ in ^{162}Ho ε decay (67.0 min) scheme, giving %IT=63 and %ε+%β^+=37. These values are also reproduced using Ice(L+M+N)(38.34)/Ice(K+L+M+N)(184.99) from 1961Jo10. One can use data from 1961Ha23 to estimate %IT and %ε+%β^+ from the same ratios but more scattered results are obtained, reason for which only the results based on 1961Jo10 data are adopted here.

^{162}Ho-%IT decay: Additional information 1.

Additional information 10.

1999IsZZ: studied internal-conversion electrons using a constant-field magnetic spectrograph (resolution≈0.04%). Source material produced by proton bombardment of a Ta target followed by chemical purification. Report Ice from various subshells for four transitions, two of which are previously unreported.

1974Vi05: Produced by ^{162}Dy(d,2n) on an enriched target. ce and x-ray spectra measured with Si(Li) detector.

For other studies, see 1961Jo10, 1961Ha23. Also, 1978Sc10, 1973St22, 1973Ba21, 1971Wo09, 1969Ak01, 1965GrZZ, 1964Ma10, 1957Mi67.

Data are from 1999IsZZ, unless noted otherwise.

^{162}Ho Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0#	1$^+$	15.0 min *10*	$T_{1/2}$: from ^{162}Ho Adopted Levels.
38.335# *18*	2$^+$	1.2 ns *2*	$T_{1/2}$: from 1978Sc10. Additional information 11.
96.071# *21*	3$^+$		
105.87@ *6*	6$^-$	67.0 min *7*	E(level): from a least-squares fit to the listed γ-ray energies. $T_{1/2}$: from ^{162}Ho Adopted Levels.

† From a least-squares fit to the listed γ-ray energies. The uncertainties are given to only the nearest 0.01 keV.

‡ From ^{162}Ho Adopted Levels.

\# Band(A): K^π=1$^+$ band. Configuration=(π 7/2[523])-(ν 5/2[523]).

@ Band(B): K^π=6$^-$ bandhead. Configuration=(π 7/2[523])+(ν 5/2[642]) with a mixture of configuration=(π 7/2[523])+(ν 3/2[651]).

γ(^{162}Ho)

E_γ	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α‡	$I_{(\gamma+ce)}$†	Comments
9.80 *5*	1.90×10^{-6} *23*	105.87	6$^-$	96.071	3$^+$	E3	4.77×10^7 *7*	100	%Iγ≈1.2×10^{-6} I_γ: calculated with the formula Iγ=[Ice(M2)+Ice(M3)+Ice(N2,3)]/[α(M2)+α(M3)+α(N2)+α(N3)], using Ice(M2)=10 *2*, Ice(M3)=10 *2*, Ice(N2,3)=4.5 *7* (1999IsZZ) and α(M2)=4.32×10^6 *16*, α(M3)=6.10×10^6 *22*, α(N2)=1.04×10^6 *4*, α(N3)1.44×10^6 *6* (code BrIcc). Additional information 12.

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^{162}Ho IT decay (67.0 min) 1999IsZZ (continued)

$\gamma(^{162}Ho)$ (continued)

E_γ	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α‡	$I_{(\gamma+ce)}$†	Comments
									Mult.: from Ice(M2)/Ice(M3)/Ice(N2,N3)=10 *2*/10 *2*/4.5 *7* (1999IsZZ); α: computed using RAINE (2002Ba85). Since Eγ lies so close to the L1 and L2 subshell binding energies, α cannot be reliably calculated by standard BrIcc code, reason for which RAINE computer code package was used. $I_{(\gamma+ce)}$: I(γ+ce)=90 *11* calculated from Iγ and α, which covers the expected I(γ+ce)=100.
38.34 *2*	12.7 *11*	38.335	2$^+$	0	1$^+$	M1	6.88	100 *9*	ce(L)/(γ+ce)=0.682 *6*; ce(M)/(γ+ce)=0.151 *3*; ce(N+)/(γ+ce)=0.0403 *8* ce(N)/(γ+ce)=0.0350 *7*; ce(O)/(γ+ce)=0.00507 *10*; ce(P)/(γ+ce)=0.000283 *6* %Iγ≈8.0 I_γ: weighted average of: 12.7 *14*, from Ice(L1)=61.5 *70* and α(L1)=4.85 *7*; 12.8 *27*, from Ice(L2)=5.7 *12* and α(L2)=0.446 *7*; and 12.5 *21*, from Ice(L3)=0.91 *15* and α(L3)=0.0726 *11* (with Ice(L1), Ice(L2) Ice(L3) measured by 1999IsZZ and α(L1), α(L2), α(L3) calculated by code BrIcc). Mult.,δ: from L-subshell ratios. The evaluator computes, at the 1σ level, the uncertainty in δ(E2/M1) to be <0.043. Note that 1999IsZZ quote %E2=0.21 *12* for this transition.
57.74 *2*	7.1 *6*	96.071	3$^+$	38.335	2$^+$	M1	12.63	97 *8*	ce(K)/(γ+ce)=0.775 *6*; ce(L)/(γ+ce)=0.1181 *22*; ce(M)/(γ+ce)=0.0261 *5*; ce(N+)/(γ+ce)=0.00699 *14* ce(N)/(γ+ce)=0.00606 *12*; ce(O)/(γ+ce)=0.000880 *17*; ce(P)/(γ+ce)=4.91×10^{-5} *10* %Iγ≈4.5 I_γ: weighted average of: 7.3 *9*, from Ice(L1)=10.7 *13* and α(L1)=1.459 *21*; 7.0 *10*, from Ice(L2)=0.92 *13* and α(L2)=0.1310 *19*; and 6.7 *14*, from Ice(L3)=0.14 *3* and α(L3)=0.0209 *3* (with Ice(L1), Ice(L2) Ice(L3) measured by 1999IsZZ and α(L1), α(L2), α(L3) calculated by code BrIcc). Mult.,δ: from L-subshell ratios. The evaluator computes, at the 1σ level, the uncertainty in δ(E2/M1) to be <0.023. 1974Vi05 report δ<0.084. However, 1999IsZZ quote %E2=0.29 *18* for this transition.
96.06 *3*	0.131 *15*	96.071	3$^+$	0	1$^+$	E2	3.28	0.56 *7*	α(K)=1.210 *17*; α(L)=1.591 *23*; α(M)=0.384 *6*; α(N+..)=0.0968 *14* α(N)=0.0865 *13*; α(O)=0.01026 *15*; α(P)=5.01×10^{-5} *7* %Iγ≈0.083 I_γ: weighted average of: 0.124 *25*, from Ice(L1)=0.15 *3* and α(L1)=1.210 *17*; 0.135

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^{162}Ho IT decay (67.0 min) 1999IsZZ (continued)

$\gamma(^{162}Ho)$ (continued)

E_γ	E_i(level)	Comments
		27, from Ice(L2)=0.10 *2* and α(L2)=0.741 *11*; and 0.135 *27*, from Ice(L3)=0.10 *2* and α(L3)=0.739 *11* (with Ice(L1), Ice(L2) Ice(L3) measured by 1999IsZZ and α(L1), α(L2), α(L3) calculated by code BrIcc). Mult.: from relative intensities of K, L2, L3 conversion lines.

† For absolute intensity per 100 decays, multiply by ≈0.63.
‡ 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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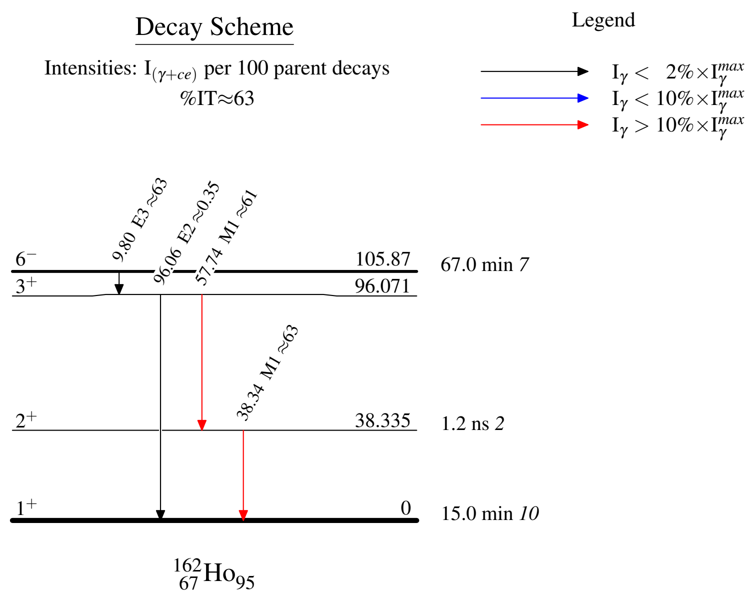
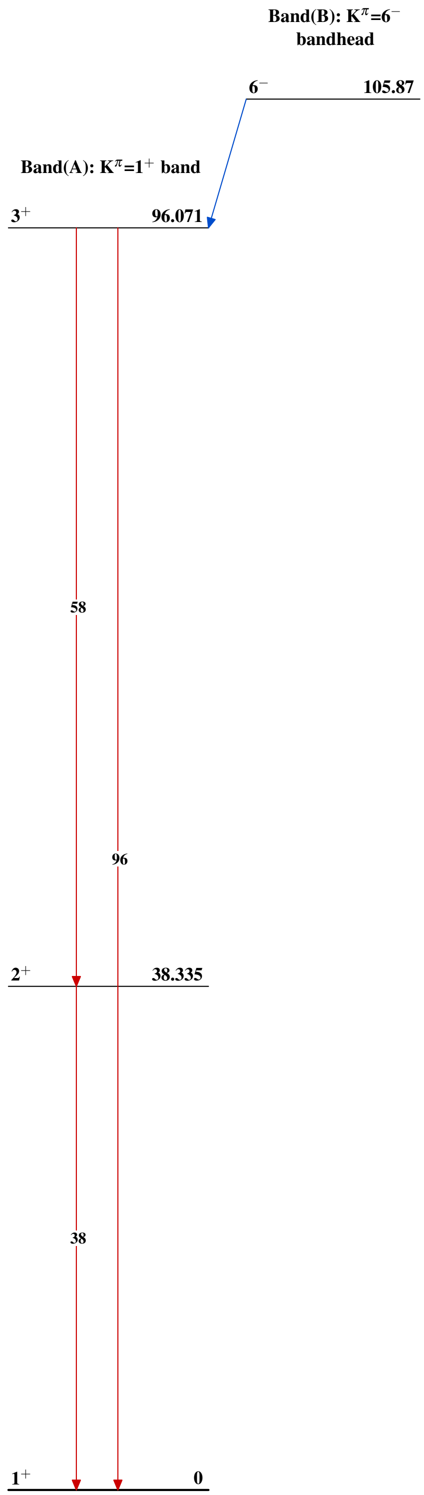


^{162}Ho IT decay (67.0 min) 1999IsZZ



$^{162}_{67}Ho_{95}$