Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

Q(β^-)=−4115 *14*; S(n)=8371 *19*; S(p)=1539 *17*; Q(α)=3.39×10^3 *5* 2017Wa10
Q(ε)=7364 *14*; S(2n)=2.010×10^4 *19*; S(2p)=5987 *17*; Q(εp)=2254 *15* 2017Wa10
Additional information 1.
Evaluators assumed that the low-spin level is the ground state. However, the high-spin level could well be the ground state.
α: Additional information 2.
α: Additional information 3.

^{150}Ho Levels

Cross Reference (XREF) Flags

A ^{154}Tm α decay (3.30 s)
B ^{154}Tm α decay (8.1 s)
C ^{150}Er ε decay (18.5 s)
D (HI,xnγ)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	(2)$^-$	72 s *4*	ABCD	%ε+%β^+=100 J$^\pi$: E1 γ from 1$^+$. T$_{1/2}$: from 1982No08. Others: 88 s *15* (1980Li18), 90 s *10* (1982Mo19), 78 s *2* (1993Al03).
x	(9)$^+$	23.5 s *3*	A D	%ε+%β^+=100 Configuration=((π h$_{11/2}$)$^{+3}$(ν f$_{7/2}$))9$^+$ (1986Mc14) E(level): X=0 *50* from 2012Au06. J$^\pi$: log *ft*=4.7 to 8$^+$ and association of this high spin isomer with the two-quasiparticle configuration=((π h$_{11/2}$)(ν f$_{7/2}$))9$^+$ (1986Mc14). T$_{1/2}$: from average of 23.3 s *3* (1990Sa32), 24.0 s *6* (1993Al03), 26 s *2* (1982Mo19), 24 s *1* (1980Li18).
130.01 *9*	(1$^+$)#		BC	J$^\pi$: E1 γ to (2)$^-$, log *ft*=5.7 from 0$^+$ points to 1$^+$, but result not confirmed in TAGS experiment.
197+x *1*			A	
216.77+x *9*	(8$^+$)		D	
476.16 *19*	1$^+$		C	J$^\pi$: log *ft*=3.70 from 0$^+$.
1096.03+x *9*	(11$^-$)	18 ns *2*	D	
1152.01 *22*	1$^+$#		C	J$^\pi$: log *ft*=5.2 from 0$^+$ parent.
1359.61+x *16*	(12$^-$)		D	
1450.77 *24*	(1)$^+$#		C	Additional information 4.
1490.28 *23*	1$^+$#		C	J$^\pi$: log *ft*=5.1 from 0$^+$ parent.
1535.02+x *9*	(11$^+$)		D	
1988.60+x *14*	(13$^-$)		D	
2247.03+x *12*	(13$^+$)		D	
2301.56+x *15*	(15$^-$)		D	
2431.23+x *18*			D	
2527.24+x *14*	(15$^+$)		D	
2625.44+x *17*	(17$^+$)	84 ns *8*	D	
3684.4+x *10*	(18$^-$)		D	
4033.8+x *13*	(20$^-$)		D	
4124.8+x *14*	(21)		D	
4580.1+x *13*	(21)		D	
4885.6+x *16*	(22)		D	
5130.3+x *15*	(22)		D	

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Adopted Levels, Gammas (continued)

^{150}Ho Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	$T_{1/2}$	XREF
5307.9+x *15*	(22)	D	7212.1+x *21*	(27)		D
5674.3+x *17*	(23)	D	7883.1+x *24*			D
5766.6+x *15*	(23)	D	7912.1+x *23*	(28)	787 ns *36*	D
6011.1+x *16*	(24)	D	9149+x *3*			D
6202.1+x *19*	(27)	D	9705+x *3*			D
6849.1+x *21*	(26)	D	10388+x *3*			D
6940.1+x *21*	(26)	D	10753+x *3*			D
7136.1+x *21*	(27)	D				

† From least-squares fit to Eγ, assuming that the energy of the two isomers is equal to zero. The uncertainties in the energy of the isomers was not propagated.

‡ Values assigned through systematics of adjacent Tb, Dy and Ho nuclei, and shell-model predictions.

log *ft* suggests $J^\pi=1^+$ but feedings are small and the decay scheme is probably incomplete.

γ(^{150}Ho)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α	Comments
130.01	(1^+)	130.0 *1*	100	0.0	$(2)^-$	E1†	0.1574	α(K)=0.1318 *19*; α(L)=0.0201 *3*; α(M)=0.00442 *7*; α(N)=0.001010 *15*; α(O)=0.0001384 *20* α(P)=6.24×10^{-6} *9*; α(N+..)=0.001155 *17*
197+x		197 *1*	100	x	$(9)^+$			
216.77+x	(8^+)	216.8 *1*	100	x	$(9)^+$			
476.16	1^+	346.1 *2*	0.50 *10*	130.01	(1^+)	E2	0.0436	α(K)=0.0332 *5*; α(L)=0.00805 *12*; α(M)=0.00185 *3*; α(N)=0.000424 *6*; α(O)=5.59×10^{-5} *8* α(P)=1.761×10^{-6} *25*; α(N+..)=0.000482 *7*
		475.8	100	0.0	$(2)^-$	E1†	0.00599 *9*	α(K)=0.00508 *8*; α(L)=0.000707 *10*; α(M)=0.0001547 *22*; α(N)=3.57×10^{-5} *5*; α(O)=5.12×10^{-6} *8* α(P)=2.74×10^{-7} *4*; α(N+..)=4.11×10^{-5} *6* Mult.: from 1989KIZX.
1096.03+x	(11^-)	879.4 *2*	9.4 *9*	216.77+x	(8^+)			This would be an E3 gamma with B(E3)(W.u.)=10.6 *17*.
		1096.0 *1*	100 *5*	0.0	$(2)^-$			This would be a M2 gamma with B(M2)(W.u.)=0.035 *5*.
1152.01	1^+	1022.1 *3*	100 *22*	130.01	(1^+)			
		1151.9 *3*	56 *11*	0.0	$(2)^-$			
1359.61+x	(12^-)	263.7	100	1096.03+x	(11^-)			
1450.77	$(1)^+$	1320.5 *4*	0.30 *15*	130.01	(1^+)			
		1450.9 *3*	1.0×10^2 *3*	0.0	$(2)^-$			
1490.28	1^+	1014.0 *3*	100 *22*	476.16	1^+			
		1490.4 *3*	44 *11*	0.0	$(2)^-$			
1535.02+x	(11^+)	1535.0 *1*	100	x	$(9)^+$			
1988.60+x	(13^-)	629.0 *1*	100 *6*	1359.61+x	(12^-)			
		892.6 *2*	28.0 *20*	1096.03+x	(11^-)			
2247.03+x	(13^+)	712.0 *1*	74 *4*	1535.02+x	(11^+)			

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Adopted Levels, Gammas (continued)

γ(^{150}Ho) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α	Comments
2247.03+x	(13$^+$)	887.4 *2*	100 *7*	1359.61+x	(12$^-$)			
2301.56+x	(15$^-$)	313.0 *1*	100	1988.60+x	(13$^-$)			
2431.23+x		129.8 *2*	52	2301.56+x	(15$^-$)			
		442.5 *2*	100 *12*	1988.60+x	(13$^-$)			
2527.24+x	(15$^+$)	96.0 *2*	11.1 *11*	2431.23+x				
		225.7 *1*	100 *5*	2301.56+x	(15$^-$)	E1	0.0367	α(K)=0.0310 *5*; α(L)=0.00450 *7*; α(M)=0.000989 *14*; α(N)=0.000227 *4*; α(O)=3.19×10^{-5} *5* α(P)=1.572×10^{-6} *22*; α(N+..)=0.000261 *4*
		280.2 *1*	89 *5*	2247.03+x	(13$^+$)			
2625.44+x	(17$^+$)	98.2 *1*	100	2527.24+x	(15$^+$)	(E2)‡	3.02	α(K)=1.149 *17*; α(L)=1.437 *22*; α(M)=0.347 *6*; α(N)=0.0781 *12*; α(O)=0.00928 *14* α(P)=4.76×10^{-5} *7*; α(N+..)=0.0875 *13* B(E2)(W.u.)=3.9 *4* Mult.: M1 or E2 allowed by α(exp). E2 required by ΔJ^π based on systematics.
3684.4+x	(18$^-$)	1059 *1*	100	2625.44+x	(17$^+$)	(E1)	0.001175 *17*	α=0.001175 *17*; α(K)=0.001004 *15*; α(L)=0.0001340 *19*; α(M)=2.92×10^{-5} *5* α(O)=9.83×10^{-7} *14*; α(P)=5.56×10^{-8} *8*; α(N+..)=7.80×10^{-6}
4033.8+x	(20$^-$)	349 *1*	100	3684.4+x	(18$^-$)	(E2)	0.0425 *7*	α(K)=0.0324 *6*; α(L)=0.00782 *14*; α(M)=0.00180 *4*; α(N)=0.000412 *8*; α(O)=5.44×10^{-5} *10* α(P)=1.72×10^{-6} *3*; α(N+..)=0.000468 *8*
4124.8+x	(21)	91 *1*	100	4033.8+x	(20$^-$)	M1	3.42 *12*	α(K)=2.88 *11*; α(L)=0.428 *16*; α(M)=0.095 *4*; α(N)=0.0219 *8*; α(O)=0.00319 *12* α(P)=0.000179 *7*; α(N+..)=0.0253 *9*
4580.1+x	(21)	455 *1*	100 *18*	4124.8+x	(21)			
		546 *1*	5.×10^1 *3*	4033.8+x	(20$^-$)			
		896 *1*	18 *9*	3684.4+x	(18$^-$)			
4885.6+x	(22)	761 *1*	100	4124.8+x	(21)			
5130.3+x	(22)	550 *1*	100	4580.1+x	(21)			
5307.9+x	(22)	1183 *1*	42 *8*	4124.8+x	(21)			
		1274 *1*	100 *12*	4033.8+x	(20$^-$)			
5674.3+x	(23)	789 *1*	100	4885.6+x	(22)			
5766.6+x	(23)	636 *1*	1.0×10^2 *3*	5130.3+x	(22)			
		1642 *1*	15 *5*	4124.8+x	(21)			
6011.1+x	(24)	337 *1*	100 *8*	5674.3+x	(23)			
		703 *1*	93 *8*	5307.9+x	(22)			
6202.1+x	(27)	191 *1*	100	6011.1+x	(24)			
6849.1+x	(26)	647 *1*	100	6202.1+x	(27)			
6940.1+x	(26)	738 *1*	100	6202.1+x	(27)			
7136.1+x	(27)	287 *1*	7 *4*	6849.1+x	(26)			
		934 *1*	100 *11*	6202.1+x	(27)			
7212.1+x	(27)	272 *1*	45 *6*	6940.1+x	(26)			
		363 *1*	100 *6*	6849.1+x	(26)			

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Adopted Levels, Gammas (continued)

$\gamma(^{150}Ho)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
7883.1+x		671 *1*	100	7212.1+x	(27)
7912.1+x	(28)	776 *1*	100	7136.1+x	(27)
9149+x		1237 *1*	100	7912.1+x	(28)
9705+x		556 *1*	100	9149+x	
10388+x		683 *1*	100 *25*	9705+x	
		1239 *1*	1.0×10^2 *3*	9149+x	
10753+x		365 *1*	54 *15*	10388+x	
		1048 *1*	100 *23*	9705+x	

† From ε decay.
‡ From (HI,xnγ).

Adopted Levels, Gammas

Level Scheme

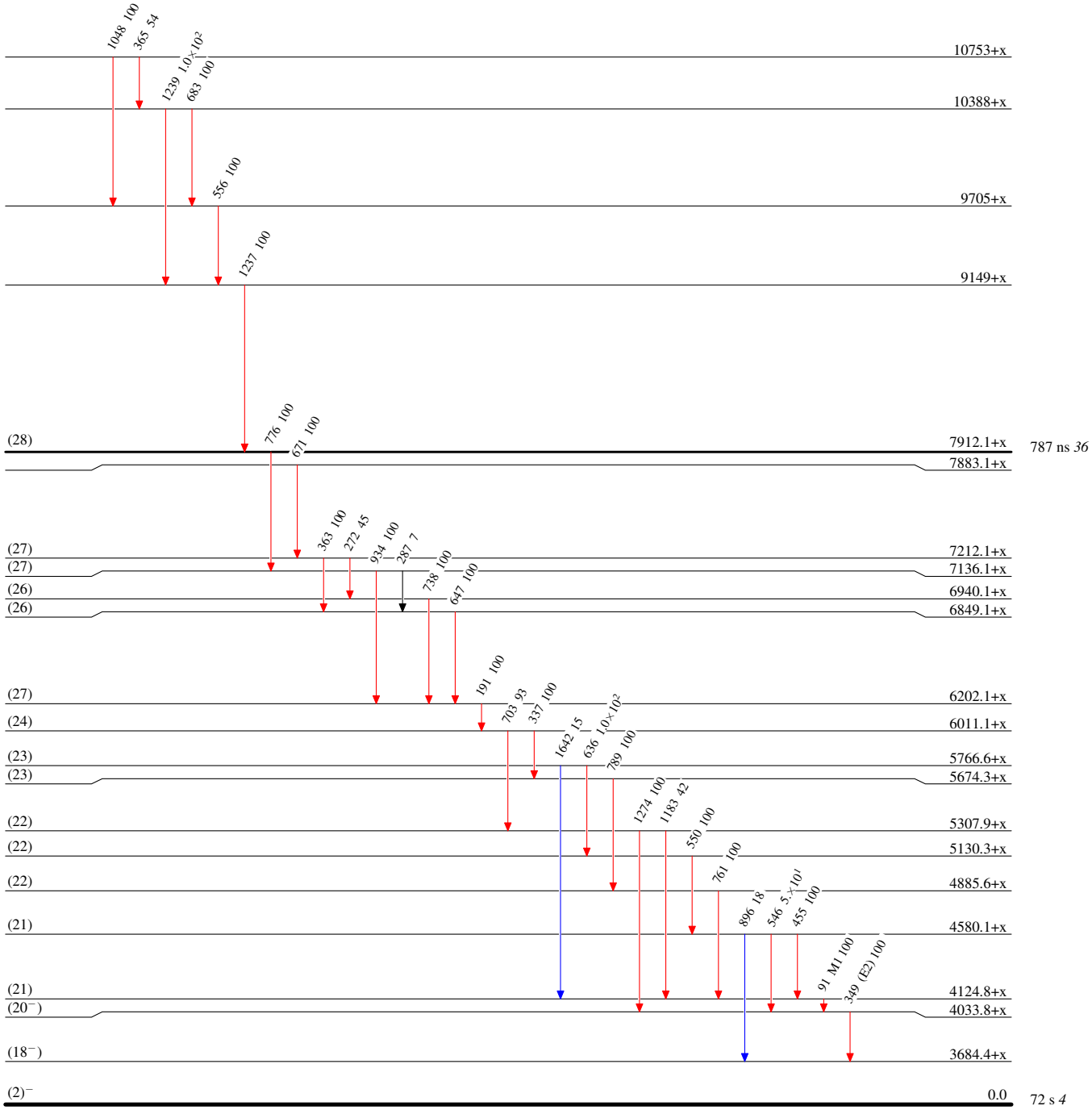
Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

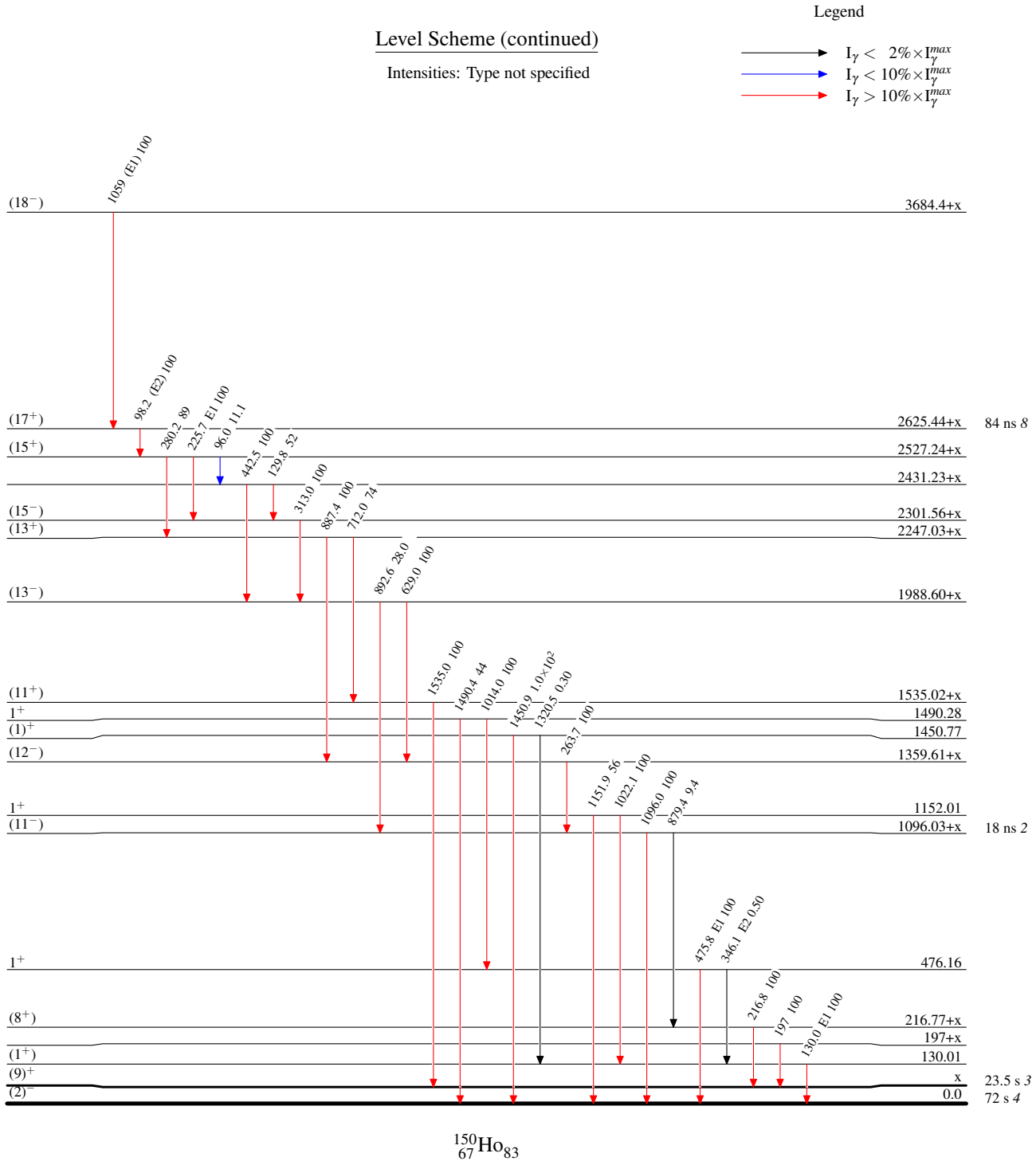


$^{150}_{67}Ho_{83}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{150}_{67}Ho_{83}$