^{167}Dy β^- decay 1977Tu01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 90, 431 (2000)	5-Jul-2000

Parent: ^{167}Dy: E=0.0; $J^\pi=(1/2^-)$; $T_{1/2}$=6.20 min *8*; Q(β^-)=2350 *60*; %β^- decay=100.0

Others: 1974Ka21, 1999As03.

1977Tu01: sources from ^{170}Er(n,α) (E(n)=14-15 MeV, Er oxide targets enriched to 96.9% in ^{170}Er); measured Eβ, Iβ (plastic scin), Eγ, Iγ (Ge(Li) with FWHM=0.50 keV at 60 keV (for x rays); two coaxial Ge(Li) with FWHM≈2.2 keV at 1.33 MeV), $\gamma\gamma$ coin, prompt and delayed $\beta\gamma$ coin.

^{167}Ho Levels

E(level)	J^π†	$T_{1/2}$	Comments
0.0	$7/2^-$	3.1 h *1*	
259.34 *11*	$3/2^+$	6.0 μs *10*	$T_{1/2}$: $\beta\gamma$(t).
319.73 *13*	$5/2^+$		
392.52 *13*	$(1/2^+)$		
409.96 *12*	$3/2^+$		
569.67 *12*	$(3/2^-)$		
921.88? *24*			
1099.68 *24*			
1149.0 *3*			
1168.88? *24*			
1240.6 *4*			
1664.9 *4*			
1918.9? *3*	$(1/2^-,3/2^-)$		

† Adopted values.

β^- radiations

β^- feedings are from intensity imbalance at each level (no feeding to g.s. expected, as $\Delta J^\pi=3$,No; feedings to low-energy levels are uncertain because of lack of multipolarity information for the low-energy γ rays.

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(4.3×10^2 *6*)	1918.9?	0.46 *5*	5.43 *22*	av Eβ=127 *21*
(6.9×10^2 *6*)	1664.9	0.78 *12*	5.88 *16*	av Eβ=217 *23*
(1.11×10^3 *6*)	1240.6	≈1.3	≈6.4	av Eβ=381 *25*
(1.18×10^3 *6*)	1168.88?	1.01 *22*	6.61 *13*	av Eβ=410 *25*
(1.20×10^3 *6*)	1149.0	0.80 *16*	6.74 *12*	av Eβ=418 *25*
(1.25×10^3 *6*)	1099.68	1.08 *23*	6.67 *13*	av Eβ=439 *25*
(1.43×10^3 *6*)	921.88?	0.72 *21*	7.07 *15*	av Eβ=513 *26*
(1.78×10^3 *6*)	569.67	82 *4*	5.38 *7*	av Eβ=663 *26*
(1.94×10^3 *6*)	409.96	1.7 *5*	7.20 *14*	av Eβ=733 *27*
(1.96×10^3 *6*)	392.52	5.6 *11*	6.70 *10*	av Eβ=740 *27*
(2.09×10^3 *6*)	259.34	<5	>6.9	av Eβ=799 *27*

† Absolute intensity per 100 decays.

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$\gamma(^{167}Ho)$

Iγ normalization: from total I(γ+ce) to g.s.=100% (no feeding to g.s. expected, as ΔJ^π=3, No.
Iγ(Ho K x ray)=810 *120*, relative to Iγ=1000 for 569.7γ. The corresponding decay-scheme value is Iγ(Ho K x ray)=644.

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[@]	Comments
60.44 *8*	19 *3*	319.73	5/2$^+$	259.34	3/2$^+$	M1(+E2)	≤1	13.9 *24*	α(K)=7.8 *19*; α(L)=5 *4*; α(M)=1.1 *8*; α(N+..)=0.30 *22* Mult.: from α(K)exp=11 *5* (comparison of K x-ray and γ-ray intensities in singles and coincidence spectra); α(K)(M1 theory)=9.60, α(K)(E2 theory)=2.31.
72.67[‡&] *10*	≈3	392.52	(1/2$^+$)	319.73	5/2$^+$	[E2]		9.9	α(K)=2.10; α(L)=5.94; α(M)=1.43; α(N+..)=0.389
90.26 *8*	8.9 *13*	409.96	3/2$^+$	319.73	5/2$^+$	[M1,E2]		3.9[†] *4*	α(K)=2.2 *8*; α(L)=1.3 *9*; α(M)=0.31 *21*; α(N+..)=0.09 *6*
133.19 *7*	65 *5*	392.52	(1/2$^+$)	259.34	3/2$^+$	[M1,E2]		1.09[†] *9*	α(K)=0.76 *24*; α(L)=0.26 *11*; α(M)=0.06 *3*; α(N+..)=0.017 *8*
150.58 *8*	14 *2*	409.96	3/2$^+$	259.34	3/2$^+$	[M1,E2]		0.74[†] *10*	α(K)=0.53 *17*; α(L)=0.16 *6*; α(M)=0.037 *14*; α(N+..)=0.010 *4*
159.71 *8*	≈10	569.67	(3/2$^-$)	409.96	3/2$^+$	[E1]		0.092	α(K)=0.0769; α(L)=0.0114; α(M)=0.00251; α(N+..)=0.00070
250.03 *13*	199 *11*	569.67	(3/2$^-$)	319.73	5/2$^+$	[E1]		0.0284	α(K)=0.0239; α(L)=0.00345; α(M)=0.00075; α(N+..)=0.00021
259.33 *13*	580 *40*	259.34	3/2$^+$	0.0	7/2$^-$	M2		0.84	α(K)=0.673; α(L)=0.131; α(M)=0.0299; α(N+..)=0.0085 $I_{(\gamma+ce)}$: 27.9% 9 based on adopted normalization. Mult.: from α(K)exp=0.69 *11* (comparison of K x-ray and γ-ray intensities in singles and coincidence spectra); α(K)(M2 theory)=0.67.
310.26 *12*	520 *30*	569.67	(3/2$^-$)	259.34	3/2$^+$	[E1]		0.0164	α(K)=0.0139; α(L)=0.00198; α(M)=0.00043; α(N+..)=0.00012
352.2 *2*	21 *2*	921.88?		569.67	(3/2$^-$)				
569.7 *2*	1000	569.67	(3/2$^-$)	0.0	7/2$^-$	[E2]		0.0115	α(K)=0.0092; α(L)=0.00168
579.4 *3*	4.7 *8*	1149.0		569.67	(3/2$^-$)				
599.2 *2*	17 *2*	1168.88?		569.67	(3/2$^-$)				
662.9[‡&] *3*	7.0 *8*	921.88?		259.34	3/2$^+$				
689.4[‡&] *3*	≈5	1099.68		409.96	3/2$^+$				
707.1 *2*	20 *4*	1099.68		392.52	(1/2$^+$)				
738.8 *4*	12 *3*	1149.0		409.96	3/2$^+$				
[x]746.0[‡] *2*	8.6 *10*								
[x]799.0[‡] *4*	≈8								
830.8 *5*	≈7	1240.6		409.96	3/2$^+$				
848.3 *10*	≈10	1240.6		392.52	(1/2$^+$)				

Continued on next page (footnotes at end of table)

^{167}Dy β^- decay 1977Tu01 (continued)

$\gamma(^{167}Ho)$ (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π
909.1[‡&] *5*	≈8	1168.88?		259.34	$3/2^+$
920.5[‡&] *5*	≈5	1240.6		319.73	$5/2^+$
981.4 *8*	≈5	1240.6		259.34	$3/2^+$
997.0 *2*	9.5 *10*	1918.9?	$(1/2^-,3/2^-)$	921.88?	
[x]1080.3[‡] *3*	6.2 *8*				
1094.6 *6*	5 *2*	1664.9		569.67	$(3/2^-)$
1272.9 *6*	6.5 *8*	1664.9		392.52	$(1/2^+)$
1405.6 *5*	4.8 *7*	1664.9		259.34	$3/2^+$

[†] Value and uncertainty cover combined range for both M1 and E2.
[‡] Isotopic assignment of γ is uncertain.
[#] For absolute intensity per 100 decays, multiply by 0.0481 *17*.
[@] 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.
[&] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays