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$^{166}_{67}\mathrm{Ho}_{99}$

1 Decay Scheme

^{166}Ho disintegrates 100% by beta minus emission to the ground state and the excited levels of ^{166}Er.
Le ^{166}Ho se désintègre par émission bêta vers le niveau fondamental et les niveaux excités du ^{166}Er.

2 Nuclear Data

$T_{1/2}(^{166}\mathrm{Ho})$	:	26,808	(20)	h
$Q^-(^{166}\mathrm{Ho})$	:	1853,8	(8)	keV

2.1 β^- Transitions

	Energy (keV)	Probability (%)	Nature	log ft
$\beta^-_{0,8}$	23,4 (8)	0,0339 (4)	Allowed	5,15
$\beta^-_{0,7}$	40,6 (9)	0,00011 (3)	1st Forbidden	8,36
$\beta^-_{0,6}$	191,4 (8)	0,296 (5)	Allowed	6,99
$\beta^-_{0,5}$	325,4 (8)	0,0028 (5)	Unique 1st Forbidden	9,51
$\beta^-_{0,4}$	393,8 (8)	0,953 (21)	1st Forbidden	7,48
$\beta^-_{0,3}$	1067,9 (8)	0,0063 (12)	Unique 1st Forbidden	11,72
$\beta^-_{0,1}$	1773,2 (8)	50,2 (8)	Unique 1st Forbidden	9,03
$\beta^-_{0,0}$	1853,8 (8)	48,4 (8)	1st Forbidden	8,17

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K (10^{-2})	α_L (10^{-2})	α_M (10^{-2})	α_T
$\gamma_{1,0}$(Er)	80,5776 (20)	51,4 (7)	E2	167,1 (24)	391 (6)	95,4 (14)	6,78 (10)
$\gamma_{2,1}$(Er)	184,4124 (36)	0,00146 (7)	E2	20,5 (3)	9,64 (14)	2,30 (4)	0,331 (5)
$\gamma_{3,2}$(Er)	520,915 (7)	0,000345 (41)	E2	1,184 (17)	0,230 (4)	0,0525 (8)	0,01481 (21)
$\gamma_{4,3}$(Er)	674,126 (8)	0,0195 (11)	E2	0,649 (9)	0,1122 (16)	0,0253 (4)	0,00793 (12)

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K (10^{-2})	α_L (10^{-2})	α_M (10^{-2})	α_T
$\gamma_{3,1}$(Er)	705,327 (6)	0,0135 (30)	M1+E2	0,611 (9)	0,1027 (15)	0,0231 (4)	0,00743 (11)
$\gamma_{3,0}$(Er)	785,905 (6)	0,01194 (24)	E2	0,463 (7)	0,0759 (11)	0,01700 (24)	0,00561 (8)
$\gamma_{5,2}$(Er)	1263,411 (10)	0,0015 (3)	E2	0,1772 (25)	0,0259 (4)	0,00573 (8)	0,00212 (3)
$\gamma_{4,1}$(Er)	1379,453 (6)	0,907 (6)	E2	0,1498 (21)	0,0216 (3)	0,00476 (7)	0,00181 (3)
$\gamma_{5,1}$(Er)	1447,823 (10)	0,0013 (4)	M1+E2	0,200 (16)	0,0279 (21)	0,0061 (5)	0,00242 (18)
$\gamma_{4,0}$(Er)	1460,031 (6)		E0				
$\gamma_{5,0}$(Er)	1528,401 (10)	0,00009 (1)	E2	0,1235 (18)	0,01754 (25)	0,00387 (6)	0,001541 (22)
$\gamma_{6,1}$(Er)	1581,857 (5)	0,1791 (14)	E1+M2	0,0524 (11)	0,00694 (15)	0,00152 (4)	0,000869 (15)
$\gamma_{6,0}$(Er)	1662,435 (5)	0,1165 (8)	E1	0,0480 (7)	0,00635 (9)	0,001386 (20)	0,000877 (13)
$\gamma_{7,1}$(Er)	1732,62 (30)	0,00005 (2)	M1+E2	0,1196 (17)	0,01664 (24)	0,00366 (6)	0,001588 (23)
$\gamma_{8,1}$(Er)	1749,847 (12)	0,02587 (27)	E1+M2	0,0462 (7)	0,00614 (9)	0,001341 (19)	0,000920 (13)
$\gamma_{7,0}$(Er)	1813,2 (3)	0,00006 (2)	M1+E2	0,1085 (16)	0,01507 (21)	0,00331 (5)	0,001497 (21)
$\gamma_{8,0}$(Er)	1830,425 (12)	0,00803 (12)	E1	0,0409 (6)	0,00540 (8)	0,001179 (17)	0,000920 (13)

3 Atomic Data

3.1 Er

ω_K : 0,942 (4)
$\bar{\omega}_L$: 0,216 (9)
n_{KL} : 0,838 (4)

3.1.1 X Radiations

		Energy (keV)	Relative probability
X_K			
	$K\alpha_2$	48,222	56,34
	$K\alpha_1$	49,128	100
	$K\beta_3$	55,495	32,50
	$K\beta_1$	55,682	
	$K\beta_5''$	56,040	
	$K\beta_2$	57,210	8,45
	$K\beta_4$	57,313	
	$KO_{2,3}$	57,456	
X_L			
	$L\ell$	6,141	
	$L\alpha$	6,906 - 6,948	
	$L\eta$	7,047	
	$L\beta$	7,746 - 8,340	
	$L\gamma$	8,815 - 9,430	

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	37,790 - 40,563	100
KLX	45,446 - 49,098	52,4
KXY	53,070 - 57,430	6,86
Auger L	3,945 - 9,693	

4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e_{AL}	(Er)	3,945 - 9,693	27,25 (19)
e_{AK}	(Er)		
	KLL	37,790 - 40,563	0,64 (5)
	KLX	45,446 - 49,098	
	KXY	53,070 - 57,430	
$ec_{1,0\ K}$	(Er)	23,092 (2)	11,04 (17)
$ec_{1,0\ T}$	(Er)	23,092 - 80,548	44,8 (7)
$ec_{1,0\ L}$	(Er)	70,826 - 72,220	25,83 (41)
$ec_{1,0\ M}$	(Er)	78,371 - 79,168	6,3 (1)
$ec_{1,0\ N}$	(Er)	80,129 - 80,573	1,427 (21)
$ec_{1,0\ O}$	(Er)	80,518 - 80,548	0,1658 (27)
$ec_{2,1\ T}$	(Er)	126,927 - 184,383	0,000482 (24)
$ec_{4,3\ T}$	(Er)	616,640 - 674,097	0,000153 (9)
$ec_{3,1\ T}$	(Er)	647,842 - 705,298	0,000100 (22)
$ec_{4,1\ T}$	(Er)	1321,968 - 1379,424	0,001638 (29)
$ec_{6,1\ T}$	(Er)	1524,372 - 1581,828	0,0001555 (29)
$ec_{6,0\ T}$	(Er)	1604,950 - 1662,406	0,0001021 (17)
$\beta^-_{0,8}$	max:	23,4 (8)	0,0339 (4)
	avg:	5,8 (2)	
$\beta^-_{0,7}$	max:	40,6 (9)	0,00011 (3)
	avg:	10,15 (23)	
$\beta^-_{0,6}$	max:	191,4 (8)	0,296 (5)
	avg:	51,28 (23)	
$\beta^-_{0,5}$	max:	325,4 (8)	0,0028 (5)
	avg:	103,42 (26)	
$\beta^-_{0,4}$	max:	393,8 (8)	0,953 (21)
	avg:	113,83 (26)	
$\beta^-_{0,3}$	max:	1067,9 (8)	0,0063 (12)
	avg:	363,16 (30)	

		Energy (keV)	Electrons (per 100 disint.)
$\beta^-_{0,1}$	max:	1773,2 (8)	50,2 (8)
	avg:	599,21 (28)	
$\beta^-_{0,0}$	max:	1853,8 (8)	48,4 (8)
	avg:	671,91 (34)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)	
XL	(Er)	6,141 - 9,430	7,88 (13)	
XKα_2	(Er)	48,222	2,97 (5)	Kα
XKα_1	(Er)	49,128	5,27 (9)	
XKβ_3	(Er)	55,495	1,71 (4)	K$'\beta_1$
XKβ_1	(Er)	55,682		
XKβ''_5	(Er)	56,040		
XKβ_2	(Er)	57,210	0,445 (13)	K$'\beta_2$
XKβ_4	(Er)	57,313		
XKO$_{2,3}$	(Er)	57,456		

5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{1,0}$(Er)	80,5776 (20)	6,605 (28)
$\gamma_{2,1}$(Er)	184,4124 (36)	0,001457 (70)
$\gamma_{3,2}$(Er)	520,914 (7)	0,00034 (4)
$\gamma_{4,3}$(Er)	674,125 (8)	0,0193 (11)
$\gamma_{3,1}$(Er)	705,326 (6)	0,0134 (30)
$\gamma_{3,0}$(Er)	785,903 (6)	0,01187 (24)
$\gamma_{5,2}$(Er)	1263,406 (10)	0,0015 (3)
$\gamma_{4,1}$(Er)	1379,447 (6)	0,905 (6)
$\gamma_{5,1}$(Er)	1447,817 (10)	0,0013 (4)
$\gamma_{5,0}$(Er)	1528,394 (10)	0,00009 (1)
$\gamma_{6,1}$(Er)	1581,849 (5)	0,1789 (14)

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{6,0}$(Er)	1662,426 (5)	0,1164 (8)
$\gamma_{7,1}$(Er)	1732,61 (30)	0,00005 (2)
$\gamma_{8,1}$(Er)	1749,838 (12)	0,02584 (27)
$\gamma_{7,0}$(Er)	1813,19 (30)	0,00006 (2)
$\gamma_{8,0}$(Er)	1830,414 (12)	0,00802 (12)

6 Main Production Modes

^{165}Ho(n,γ)^{166}Ho σ : 64,7 barns
Possible impurities: ^{166m}Ho

^{165}Ho(d,p)^{166}Ho

^{164}Dy(2n,γ)^{166}Ho

^{166}Dy β^- decay to ^{166}Ho, with $T_{1/2}$ = 81,6 (1) h

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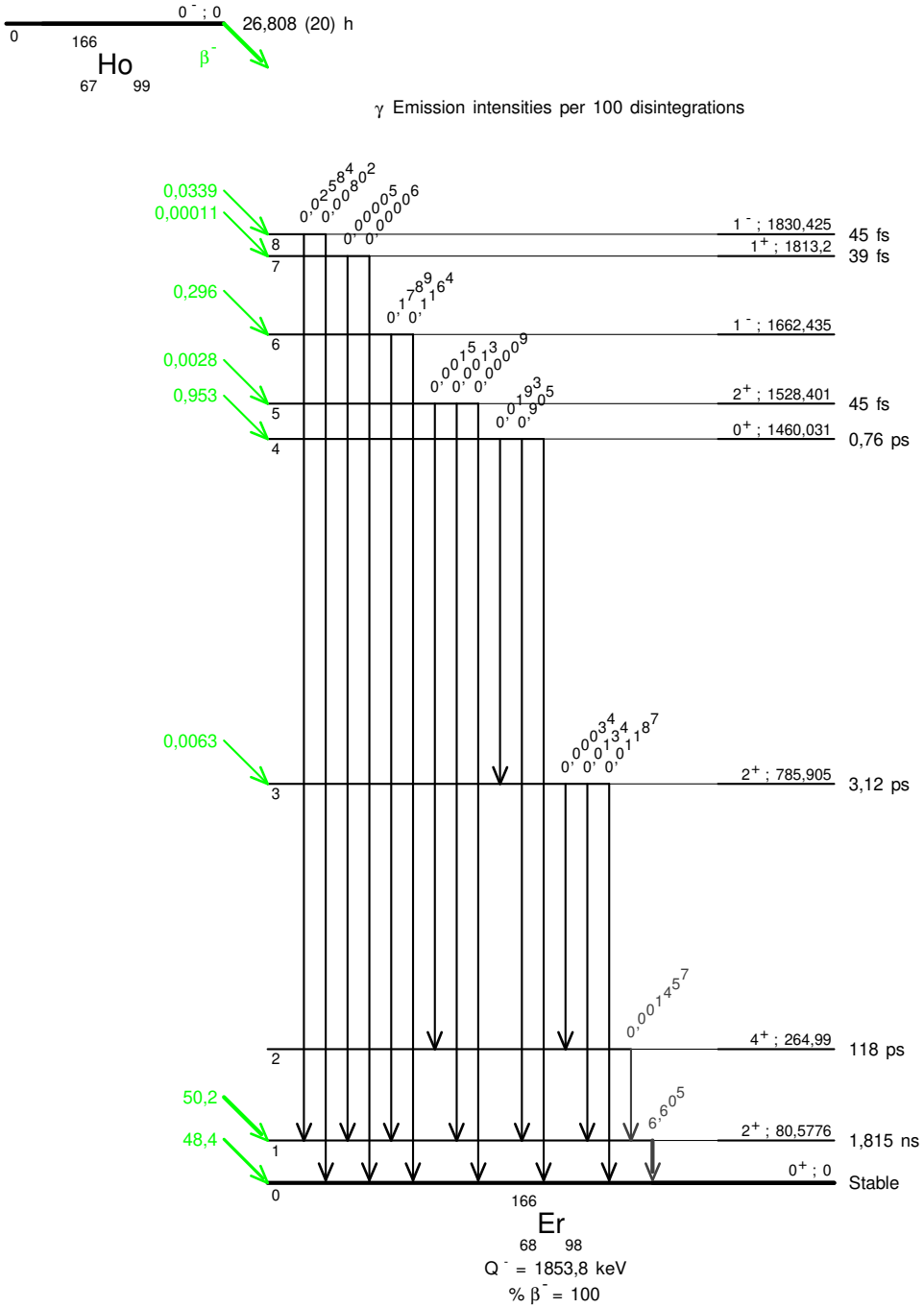
0 - ; 0
26,808 (20) h
0
166
Ho
67 99
β-
γ Emission intensities per 100 disintegrations
0,0339
0,00011
0,296
0,0028
0,953
0,0063
50,2
48,4
1 - ; 1830,425
45 fs
1+ ; 1813,2
39 fs
1 - ; 1662,435
2+ ; 1528,401
45 fs
0+ ; 1460,031
0,76 ps
2+ ; 785,905
3,12 ps
4+ ; 264,99
118 ps
2+ ; 80,5776
1,815 ns
0+ ; 0
Stable
8
7
6
5
4
3
2
1
0
166
Er
68 98
Q - = 1853,8 keV
% β- = 100