$^{177}_{71}\mathrm{Lu}_{106}$

1 Decay Scheme

The Lu-177 ground state (JPI=7/2+) disintegrates by beta- emission (PB-=100%) to the ground state (JPI=7/2-) and to three excited levels (JPI=9/2-,11/2- and 9/2+) of Hf-177.
Le lutécium 177 se désintègre par émission bêta moins vers le niveau fondamental d' hafnium 177 via trois niveaux excités.

2 Nuclear Data

$T_{1/2}(^{177}\mathrm{Lu}\ )$: 6,647 (4) d
$Q^-(^{177}\mathrm{Lu}\ )$: 498,3 (8) keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,3}$	177,0 (8)	11,64 (10)	Allowed	6,1
$\beta^-_{0,2}$	248,6 (8)	0,012 (8)	1st forbidden Unique	9,2
$\beta^-_{0,1}$	385,4 (8)	9,1 (5)	1st Forbidden	7,3
$\beta^-_{0,0}$	498,3 (8)	79,3 (5)	1st Forbidden	6,7

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{3,2}$(Hf)	71,6418 (6)	0,327 (6)	E1+M2	0,715 (14)	0,138 (6)	0,0317 (14)	0,894 (22)
$\gamma_{1,0}$(Hf)	112,9498 (4)	20,29 (7)	M1+95,1%E2	0,817 (12)	1,104 (6)	0,2755 (14)	2,272 (5)
$\gamma_{2,1}$(Hf)	136,7245 (5)	0,1014 (7)	M1+90%E2	0,559 (21)	0,456 (7)	0,1129 (21)	1,158 (18)
$\gamma_{3,1}$(Hf)	208,3662 (4)	11,09 (7)	E1+0,54%M2	0,055 (4)	0,0094 (10)	0,00216 (24)	0,068 (5)
$\gamma_{2,0}$(Hf)	249,6742 (6)	0,2296 (21)	E2	0,091	0,038	0,009	0,141
$\gamma_{3,0}$(Hf)	321,3159 (6)	0,233 (8)	E1+M2	0,06 (5)	0,012 (10)	0,0028 (22)	0,08 (6)

3 Atomic Data

3.1 Hf

ω_K : 0,951 (4)
$\bar{\omega}_L$: 0,26 (1)
n_{KL} : 0,829 (4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	54,612		57,2
	$K\alpha_1$	55,7909		100
	$K\beta_3$	62,985	}	
	$K\beta_1$	63,234	}	
	$K\beta_5''$	63,662	}	33
	$K\beta_2$	64,942	}	
	$K\beta_4$	65,132	}	8,8
	$KO_{2,3}$	65,316	}	
X_L				
	$L\ell$	6,96		
	$L\alpha$	7,844 – 7,899		
	$L\eta$	8,139		
	$L\beta$	8,905 – 9,342		
	$L\gamma$	10,516 – 10,89		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	42,601 – 46,007	100
KLX	51,391 – 55,784	53,4
KXY	60,15 – 65,34	7,08
Auger L	4,3 – 11,2	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Hf)	4,3 - 11,2	8,75 (20)
e_{AK}	(Hf)		0,283 (90)
	KLL	42,601 - 46,007	}
	KLX	51,391 - 55,784	}
	KXY	60,15 - 65,34	}
$ec_{3,2\ K}$	(Hf)	6,2910 (9)	0,123 (5)
$ec_{1,0\ K}$	(Hf)	47,5990 (8)	5,07 (18)
$ec_{1,0\ L}$	(Hf)	101,678 - 101,679	6,84 (23)
$ec_{1,0\ M}$	(Hf)	110,348 - 110,349	1,71 (6)
$ec_{3,1\ K}$	(Hf)	143,0154 (8)	0,57 (5)
$ec_{3,1\ L}$	(Hf)	197,094 - 197,096	0,098 (11)
$\beta^-_{0,3}$	max:	177,0 (8)	11,64 (10)
$\beta^-_{0,3}$	avg:	47,66 (23)	
$\beta^-_{0,2}$	max:	248,6 (8)	0,012 (8)
$\beta^-_{0,2}$	avg:	78,6 (3)	
$\beta^-_{0,1}$	max:	385,4 (8)	9,1 (5)
$\beta^-_{0,1}$	avg:	111,7 (3)	
$\beta^-_{0,0}$	max:	498,3 (8)	79,3 (5)
$\beta^-_{0,0}$	avg:	149,4 (3)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Hf)	6,96 — 10,89	3,18 (6)	
$XK\alpha_2$	(Hf)	54,612	1,59 (3)	} $K\alpha$
$XK\alpha_1$	(Hf)	55,7909	2,78 (6)	}
$XK\beta_3$	(Hf)	62,985 }		
$XK\beta_1$	(Hf)	63,234 }	0,917 (23)	$K'\beta_1$
$XK\beta''_5$	(Hf)	63,662 }		
$XK\beta_2$	(Hf)	64,942 }		
$XK\beta_4$	(Hf)	65,132 }	0,245 (8)	$K'\beta_2$
$XKO_{2,3}$	(Hf)	65,316 }		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{3,2}$(Hf)	71,6418 (6)	0,1726 (23)
$\gamma_{1,0}$(Hf)	112,9498 (4)	6,20 (7)
$\gamma_{2,1}$(Hf)	136,7245 (5)	0,0470 (7)
$\gamma_{3,1}$(Hf)	208,3662 (4)	10,38 (7)
$\gamma_{2,0}$(Hf)	249,6742 (6)	0,2012 (21)
$\gamma_{3,0}$(Hf)	321,3159 (6)	0,216 (8)

6 Main Production Modes

$Lu - 176(n,\gamma)Lu - 177$ $\quad$ σ : 1778 (75) barns

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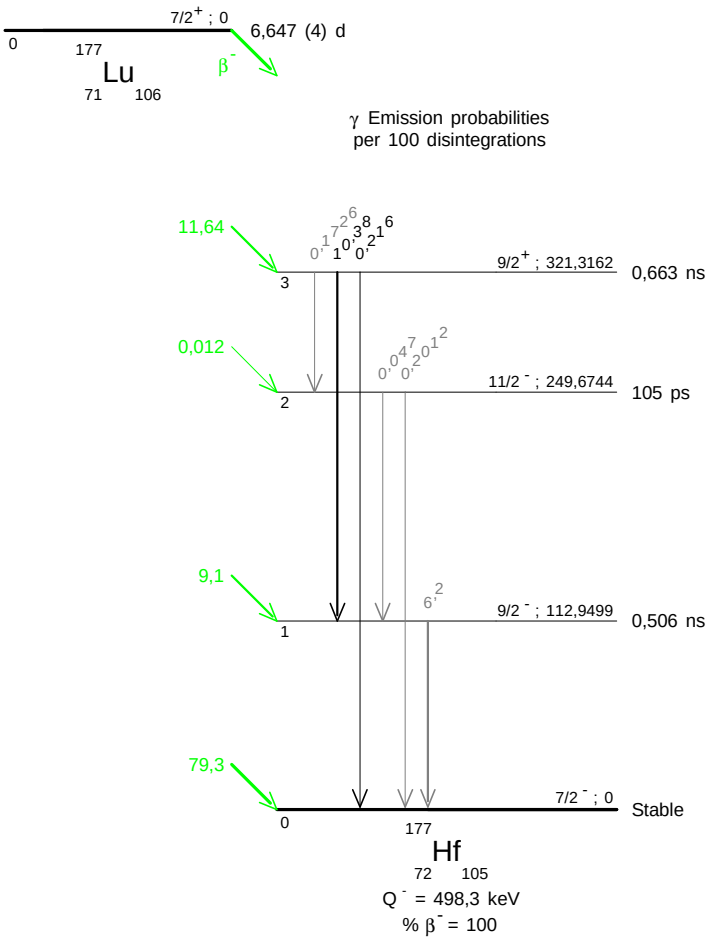
7/2+ ; 0
6,647 (4) d
0
177
Lu
71
106
β-
γ Emission probabilities
per 100 disintegrations
11,64
0,012
9,1
79,3
9/2+ ; 321,3162
0,663 ns
11/2 - ; 249,6744
105 ps
9/2 - ; 112,9499
0,506 ns
7/2 - ; 0
Stable
3
2
1
0
Hf
72
105
Q - = 498,3 keV
% β- = 100