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

1 Decay Scheme

The ^{177}Lu ground state ($J^\pi = 7/2^+$) disintegrates by β^- emission ($P_{\beta^-} = 100\%$) to the ground state ($J^\pi = 7/2^-$) and to three excited levels ($J^\pi = 9/2^-$, $11/2^-$ and $9/2^+$) of ^{177}Hf.

Le ^{177}Lu *se désintègre par émission* β^- *vers le niveau fondamental du* ^{177}Hf *via trois niveaux excités.*

2 Nuclear Data

$T_{1/2}(^{177}\mathrm{Lu})$	:	6,6443	(9)	d
$Q^-(^{177}\mathrm{Lu})$	:	496,8	(8)	keV

2.1 β^- Transitions

	Energy (keV)	Probability (%)	Nature	log ft
$\beta^-_{0,3}$	175,5 (8)	11,55 (7)	Allowed	6,15
$\beta^-_{0,2}$	247,1 (8)	0,003 (21)	Unique 1st Forbidden	9,80
$\beta^-_{0,1}$	383,8 (8)	8,99 (28)	1st Forbidden	7,34
$\beta^-_{0,0}$	496,8 (8)	79,45 (29)	1st Forbidden	6,77

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{3,2}$(Hf)	71,6425 (6)	0,326 (21)	E1+0,04%M2	0,72 (8)	0,14 (3)	0,032 (8)	0,90 (12)
$\gamma_{1,0}$(Hf)	112,95009 (36)	20,10 (27)	M1+95,6%E2	0,808 (12)	1,084 (16)	0,270 (4)	2,23 (4)
$\gamma_{2,1}$(Hf)	136,7246 (5)	0,1008 (25)	M1+91%E2	0,54 (8)	0,448 (23)	0,111 (6)	1,13 (5)
$\gamma_{3,1}$(Hf)	208,36623 (20)	11,01 (6)	E1+0,12%M2	0,047 (4)	0,0074 (9)	0,00168 (20)	0,056 (5)
$\gamma_{2,0}$(Hf)	249,6744 (6)	0,2287 (14)	E2	0,0905 (13)	0,0375 (6)	0,00911 (13)	0,1395 (20)
$\gamma_{3,0}$(Hf)	321,3162 (6)	0,2201 (22)	E1+5,4%M2	0,040 (7)	0,0073 (13)	0,0017 (3)	0,050 (8)

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
$K\beta_3$	62,98	33
$K\beta_1$	63,234	
$K\beta_5''$	63,662	
$K\beta_2$	64,98	8,8
$K\beta_4$	65,132	
$KO_{2,3}$	65,316	
X_L		
$L\ell$	6,9631	
$L\alpha$	7,8447 - 7,8991	
$L\eta$	8,1408	
$L\beta$	8,906 - 9,6084	
$L\gamma$	10,2036 - 10,8905	

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	8,48 (7)
e_{AK}	(Hf)		
	KLL	42,601 - 46,007	0,279 (24)
	KLX	51,391 - 55,784	
	KXY	60,15 - 65,34	
$ec_{3,2\ T}$	(Hf)	6,2909 - 71,6351	0,154 (21)
$ec_{3,2\ K}$	(Hf)	6,2909 (8)	0,124 (14)
$ec_{1,0\ T}$	(Hf)	47,5992 - 112,9434	13,88 (26)
$ec_{1,0\ K}$	(Hf)	47,59925 (36)	5,03 (8)
$ec_{2,1\ T}$	(Hf)	71,3734 - 136,7176	0,0535 (24)
$ec_{1,0\ L}$	(Hf)	101,6794 - 103,3894	6,75 (11)
$ec_{1,0\ M}$	(Hf)	110,3492 - 111,2884	1,680 (26)
$ec_{1,0\ N}$	(Hf)	112,412 - 112,933	0,390 (6)
$ec_{3,1\ T}$	(Hf)	143,0150 - 208,3592	0,58 (5)
$ec_{3,1\ K}$	(Hf)	143,0150 (7)	0,490 (42)
$ec_{2,0\ T}$	(Hf)	184,3234 - 249,6676	0,02800 (43)
$ec_{3,0\ T}$	(Hf)	255,9651 - 321,3093	0,0105 (17)
$\beta^-_{0,3}$	max:	175,5 (8)	11,55 (7)
	avg:	46,70 (23)	
$\beta^-_{0,2}$	max:	247,1 (8)	0,003 (21)
	avg:	77,15 (26)	
$\beta^-_{0,1}$	max:	383,8 (8)	8,99 (28)
	avg:	110,23 (26)	
$\beta^-_{0,0}$	max:	496,8 (8)	79,45 (29)
	avg:	147,75 (27)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)		
XL	(Hf)	6,9631 - 10,8905	3,12 (6)		
XKα_2	(Hf)	54,612	1,555 (27)	}	Kα
XKα_1	(Hf)	55,7909	2,72 (5)	}	
XKβ_3	(Hf)	62,98			
XKβ_1	(Hf)	63,234	0,898 (21)		K$'\beta_1$
XKβ_5''	(Hf)	63,662			
XKβ_2	(Hf)	64,98			
XKβ_4	(Hf)	65,132	0,240 (7)		K$'\beta_2$
XKO$_{2,3}$	(Hf)	65,316			

5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{3,2}$(Hf)	71,6425 (6)	0,1716 (14)
$\gamma_{1,0}$(Hf)	112,95005 (36)	6,223 (32)
$\gamma_{2,1}$(Hf)	136,7245 (5)	0,04731 (44)
$\gamma_{3,1}$(Hf)	208,3661 (2)	10,425 (35)
$\gamma_{2,0}$(Hf)	249,6742 (6)	0,2007 (12)
$\gamma_{3,0}$(Hf)	321,3159 (6)	0,2096 (14)

6 Main Production Modes

- ^{176}Lu(n,γ)^{177}Lu σ : 1778 (75) barns
- Possible impurities: ^{177m}Lu ($T_{1/2}$ = 160,4 d)

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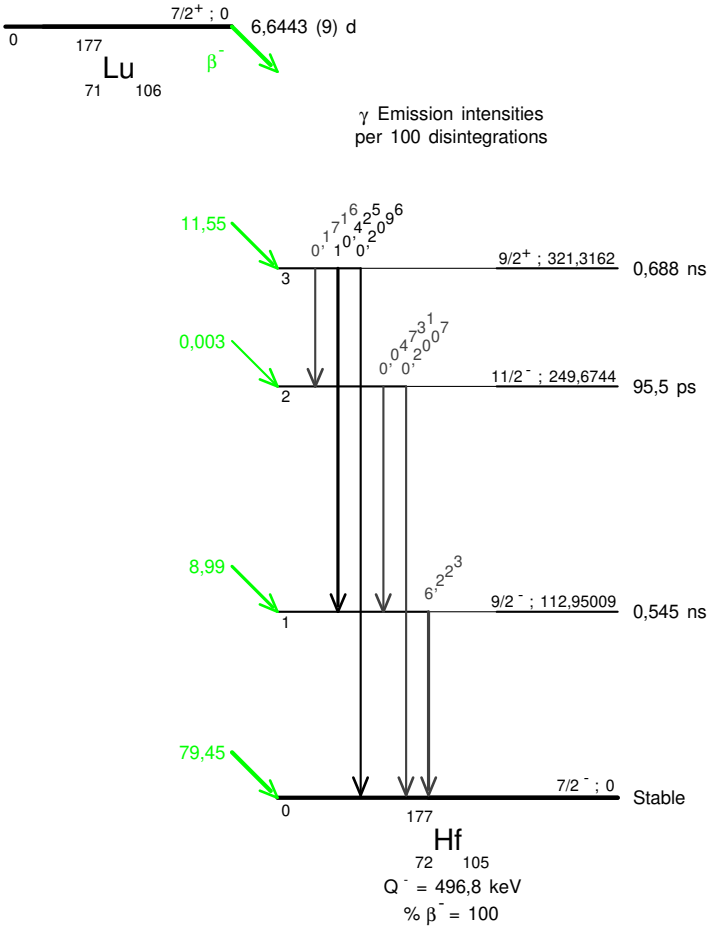
7/2+ ; 0
6,6443 (9) d
0
177
Lu
71
106
β-
γ Emission intensities
per 100 disintegrations
11,55
0,003
8,99
79,45
9/2+ ; 321,3162
0,688 ns
11/2- ; 249,6744
95,5 ps
9/2- ; 112,95009
0,545 ns
7/2- ; 0
Stable
Hf
72
105
Q- = 496,8 keV
% β- = 100