^{181}Lu β^- decay   **1982Ki04**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 106, 367 (2005)	31-Aug-2005

Parent: ^{181}Lu: E=0.0; J^π=(7/2$^+$); $T_{1/2}$=3.5 min 3; Q(β^-)=2670 SY; %β^- decay=100.0

1982Ki04: ^{181}Lu produced by W, TA(^{136}Xe,X) at 9 MeV/A; Mass separated source; Plastic scintillators for β; Ge(Li) detectors for γ's; Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\beta$-coin.

^{181}Hf Levels

E(level)	$J^{\pi\dagger}$
0.0	1/2$^-$
45.82 17	3/2$^-$
98.82 18	5/2$^-$
204.4 3	7/2$^-$
251.8 3	3/2$^-$
329.4 3	5/2$^-$
440.6 5	7/2$^-$
663.9 5	7/2$^-$
904.3 3	7/2$^-$

† From Adopted Levels.

β^- radiations

E(decay)	E(level)	I$\beta^{-\dagger}$	Log ft	Comments
(1765 SY)	904.3	68 11	5.29 13	av Eβ=650 syst
(2418 SY)	251.8	11 4	7.82^{1u} 20	av Eβ=913 syst
(2465 SY)	204.4	6 4	6.9 3	av Eβ=954 syst
(2571 SY)	98.82	14 12	6.6 4	av Eβ=1001 syst

† Absolute intensity per 100 decays.

γ(^{181}Hf)

Iγ normalization: normalized assuming the sum Iγ(g.s.)=100. Additional, substantial and unobserved β^- decay feeding is expected but should not greatly effect the normalization, because most of the decay is to levels which do not deexcite directly to the ground state.

E_γ	$I_\gamma^\ddagger$	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	$\delta^\dagger$	$\alpha^\#$	Comments
45.8 2	30 5	45.82	3/2$^-$	0.0	1/2$^-$	M1+E2	0.19 4	10.4 16	α(L)= 8.0 9; α(M)= 1.86 22
52.9 5	18 4	98.82	5/2$^-$	45.82	3/2$^-$	M1+E2	0.25 5	7.4 12	α(L)= 5.6 7; α(M)= 1.33 17; α(N+..)= 0.38 6
98.9 2	16 6	98.82	5/2$^-$	0.0	1/2$^-$	E2		3.74	α(K)= 0.991; α(L)= 2.08; α(M)= 0.518; α(N+..)= 0.148
105.7 5	18 3	204.4	7/2$^-$	98.82	5/2$^-$				
125.2 5	15 3	329.4	5/2$^-$	204.4	7/2$^-$				
153.4 7	12 5	251.8	3/2$^-$	98.82	5/2$^-$				
159.1 7	7 3	204.4	7/2$^-$	45.82	3/2$^-$	[E2]			
205.9 3	73 6	251.8	3/2$^-$	45.82	3/2$^-$				
240.4 5	21 6	904.3	7/2$^-$	663.9	7/2$^-$				

<u>$^{181}\text{Lu}\,\beta^-$ **decay**　　**1982Ki04** **(continued)**</u>

$\gamma(^{181}\text{Hf})$ (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]
252.0 *10*	8 *4*	251.8	$3/2^-$	0.0	$1/2^-$	
329.0 *5*	23 *5*	329.4	$5/2^-$	0.0	$1/2^-$	[E2]
334.4 *5*	17 *6*	663.9	$7/2^-$	329.4	$5/2^-$	
341.7 *5*	15 *4*	440.6	$7/2^-$	98.82	$5/2^-$	
463.5 *7*	21 *6*	904.3	$7/2^-$	440.6	$7/2^-$	
574.8 *5*	70 *6*	904.3	$7/2^-$	329.4	$5/2^-$	
*x*590.0 *10*	15 *5*					
652.4 *7*	100 *6*	904.3	$7/2^-$	251.8	$3/2^-$	[E2]
700.4 *8*	19 *7*	904.3	$7/2^-$	204.4	$7/2^-$	
806.0 *8*	40 *10*	904.3	$7/2^-$	98.82	$5/2^-$	
858.5 *8*	35 *10*	904.3	$7/2^-$	45.82	$3/2^-$	[E2]

[†] From (n,γ).

[‡] For absolute intensity per 100 decays, multiply by 0.22 *3*.

[#] 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.

[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I$_\gamma$ per 100 parent decays

Legend

→	I$_\gamma$ < 2%×I$_\gamma^{max}$
→	I$_\gamma$ < 10%×I$_\gamma^{max}$
→	I$_\gamma$ > 10%×I$_\gamma^{max}$

(7/2$^+$)　　0.0　　3.5 min 3

Q$_{\beta^-}$=2670 SY　　%β^-=100.0

$^{181}_{71}$Lu$_{110}$

Iβ^-　　Log ft

68　　5.29

7/2$^-$　　904.3

858.5 [E2] 7.7
806.0 9
700.4 4.2
652.4 [E2] 22
574.8 15.4
463.5 46
240.4 4.6

7/2$^-$　　663.9

334.4 3.7

7/2$^-$　　440.6

341.7 3.3

5/2$^-$　　329.4

329.0 [E2] 5.1
125.2 3.3

11　　7.82^{1u}　　3/2$^-$　　251.8

252.0 1.8
205.9 16
153.4 2.6

6　　6.9　　7/2$^-$　　204.4

159.1 [E2] 1.5
105.7 4.0

14　　6.6　　5/2$^-$　　98.82

98.9 E2 3.5
52.9 M1+E2 4.0
45.8 M1+E2 6.6

3/2$^-$　　45.82

1/2$^-$　　0.0

$^{181}_{72}$Hf$_{109}$