^{183}Lu β^- decay 1983Ry01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 134, 149 (2016)	15-Apr-2015

Parent: ^{183}Lu: E=0; J$^\pi$=(7/2$^+$); T$_{1/2}$=58 s *4*; Q(β^-)=3.57×10^3 *10*; %β^- decay=100.0

1983Ry01: ^{183}Lu from 11.7 MeV/nucleon ^{136}Xe bombardment of natural W and Ta targets; observed radiations assigned to ^{183}Lu β^- decay on the basis of x-γ coincidence data; 2 Ge(Li) detectors; measured Eγ, Iγ, $\gamma\gamma$ coin, (Kα x ray)-γ coin, Kα x ray(t). decay scheme constructed on the basis of energy sums.

For this decay, Q × Branching=3670 *100* cf. Summed decay energies = 3750 *417*.

^{183}Hf Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0[#]	(3/2$^-$)	1.018 h *2*	%β^-=100 T$_{1/2}$: from γ(t) for 459γ, 784γ and 1470γ (2006Vo12); 0.2% systematic uncertainty combined In quadrature with statistical uncertainty. others: 1.05 h *5* (1967Mo13), 1.067 h *17* (1966Ba06), 1.10 h *7* (1960Po01), 1.07 h *5* (1956Ga46).
68.57[#] *18*	(5/2$^-$)		
168.1[#] *3*	(7/2$^-$)		
205.7 *5*	(5/2$^-$)		J$^\pi$: likely configuration: 1/2[510] (J=5/2 member).
316.9 *4*	(7/2$^-$)		J$^\pi$: likely configuration: 7/2[503] (J=7/2 member) (1983Ry01).
1125.3[@] *4*	(5/2$^+$)		
1255.8[@] *6*	(7/2$^+$)		
1604.8 *8*	(≤9/2)		

[†] From least-squares fit to Eγ.
[‡] Suggested by 1983Ry01 based on systematics.
[#] Band(A): 3/2[512] band. Analogous to ^{185}W isotone.
[@] Band(B): π=(+) 3-quasiparticle band?. Possible configuration: ((π 7/2[404])(π 9/2[514])(ν 7/2[514])) (1983Ry01).

β^- radiations

E(decay)	E(level)	Iβ^-[‡]	Log *ft*[†]	Comments
(1.97×10^3 *10*)	1604.8	≈2.8	≈6.3	av Eβ=736 *44*
(2.31×10^3 *10*)	1255.8	4.5 *13*	6.37 *15*	av Eβ=888 *44*
(2.44×10^3 *10*)	1125.3	45 *8*	5.46 *11*	av Eβ=945 *45*
(3.25×10^3 *10*)	316.9	10.3 *20*	6.60 *11*	av Eβ=1305 *45*
(3.36×10^3 *10*)	205.7	5.4 *13*	6.94 *13*	av Eβ=1354 *45*
(3.40×10^3 *10*)	168.1	14 *4*	6.55 *14*	av Eβ=1371 *45*
(3.50×10^3 *10*)	68.57	18 *14*	6.5 *4*	av Eβ=1416 *45*
(3.57×10^3[#] *10*)	0	<8	>8.4^{1u}	av Eβ=1418 *45*

[†] Calculated assuming 100 keV uncertainty In Q value.
[‡] Absolute intensity per 100 decays.
[#] Existence of this branch is questionable.

^{183}Lu β^- decay 1983Ry01 (continued)

γ(^{183}Hf)

Iγ normalization: normalized assuming Σ (I(γ+ce) to g.s.)=96 *4* based on Iβ(g.s.)<8% if log $f^{1u}t$>8.5.

E$_\gamma$	I$_\gamma$[‡]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	α[†]	Comments
68.6 *2*	18 *4*	68.57	(5/2$^-$)	0	(3/2$^-$)	(M1)	11.79 *19*	α(K)=9.79 *16*; α(L)=1.56 *3*; α(M)=0.352 *6* α(N)=0.0836 *14*; α(O)=0.01280 *21*; α(P)=0.000847 *14* Mult.: intensity balance rules out E1. %Iγ=4.4 *5* assuming adopted decay scheme normalization.
99.4 *5*	10 *2*	168.1	(7/2$^-$)	68.57	(5/2$^-$)	[M1+E2]	3.84 *25*	α(K)=2.2 *13*; α(L)=1.3 *8*; α(M)=0.31 *20* α(N)=0.07 *5*; α(O)=0.010 *6*; α(P)=0.00017 *12*
137.3 *6*	4 *1*	205.7	(5/2$^-$)	68.57	(5/2$^-$)	[E2]	1.067 *23*	α(K)=0.460 *9*; α(L)=0.463 *12*; α(M)=0.115 *3* α(N)=0.0267 *7*; α(O)=0.00342 *9*; α(P)=2.81×10^{-5} *5*
148.7 *6*	5 *1*	316.9	(7/2$^-$)	168.1	(7/2$^-$)	[M1+E2]	1.05 *25*	α(K)=0.7 *4*; α(L)=0.25 *8*; α(M)=0.059 *22* α(N)=0.014 *5*; α(O)=0.0019 *6*; α(P)=6.E−5 *4*
168.2 *4*	30 *3*	168.1	(7/2$^-$)	0	(3/2$^-$)	[E2]	0.519 *9*	α(K)=0.269 *5*; α(L)=0.190 *4*; α(M)=0.0470 *9* α(N)=0.01093 *19*; α(O)=0.001417 *25*; α(P)=1.70×10^{-5} *3* %Iγ=7.3 *12* assuming adopted decay scheme normalization.
205.6 *6*	10 *3*	205.7	(5/2$^-$)	0	(3/2$^-$)	[E2]	0.262 *5*	α(K)=0.155 *3*; α(L)=0.0818 *16*; α(M)=0.0200 *4* α(N)=0.00467 *9*; α(O)=0.000614 *12*; α(P)=1.022×10^{-5} *17* ΔIγ(absolute)=0.8 per 100 decays.
[x]220.1 *5*	6 *2*							
248.7 *5*	20 *2*	316.9	(7/2$^-$)	68.57	(5/2$^-$)	[M1+E2]	0.23 *9*	α(K)=0.17 *9*; α(L)=0.0389 *10*; α(M)=0.00910 *21* α(N)=0.00214 *4*; α(O)=0.000308 *20*; α(P)=1.4×10^{-5} *8*
316.0 *10*	6 *2*	316.9	(7/2$^-$)	0	(3/2$^-$)	[E2]	0.0679 *12*	α(K)=0.0478 *8*; α(L)=0.0154 *3*; α(M)=0.00370 *7* α(N)=0.000865 *16*; α(O)=0.0001183 *22*; α(P)=3.44×10^{-6} *6*
[x]449.3 *6*	8 *2*							
957.3 *6*	12 *3*	1125.3	(5/2$^+$)	168.1	(7/2$^-$)			
1056.7 *5*	66 *7*	1125.3	(5/2$^+$)	68.57	(5/2$^-$)			
1087.7 *6*	12 *3*	1255.8	(7/2$^+$)	168.1	(7/2$^-$)			
1125.3 *5*	100 *10*	1125.3	(5/2$^+$)	0	(3/2$^-$)			%Iγ=24 *4* assuming adopted decay scheme normalization.
1187.0 *10*	6 *3*	1255.8	(7/2$^+$)	68.57	(5/2$^-$)			
1436.5 *10*	≈5	1604.8	(≤9/2)	168.1	(7/2$^-$)			
1536.5 *10*	≈6	1604.8	(≤9/2)	68.57	(5/2$^-$)			
[x]1596.7 *10*	≈9							

[†] Additional information 1.
[‡] For absolute intensity per 100 decays, multiply by 0.25 *4*.
[x] γ ray not placed in level scheme.

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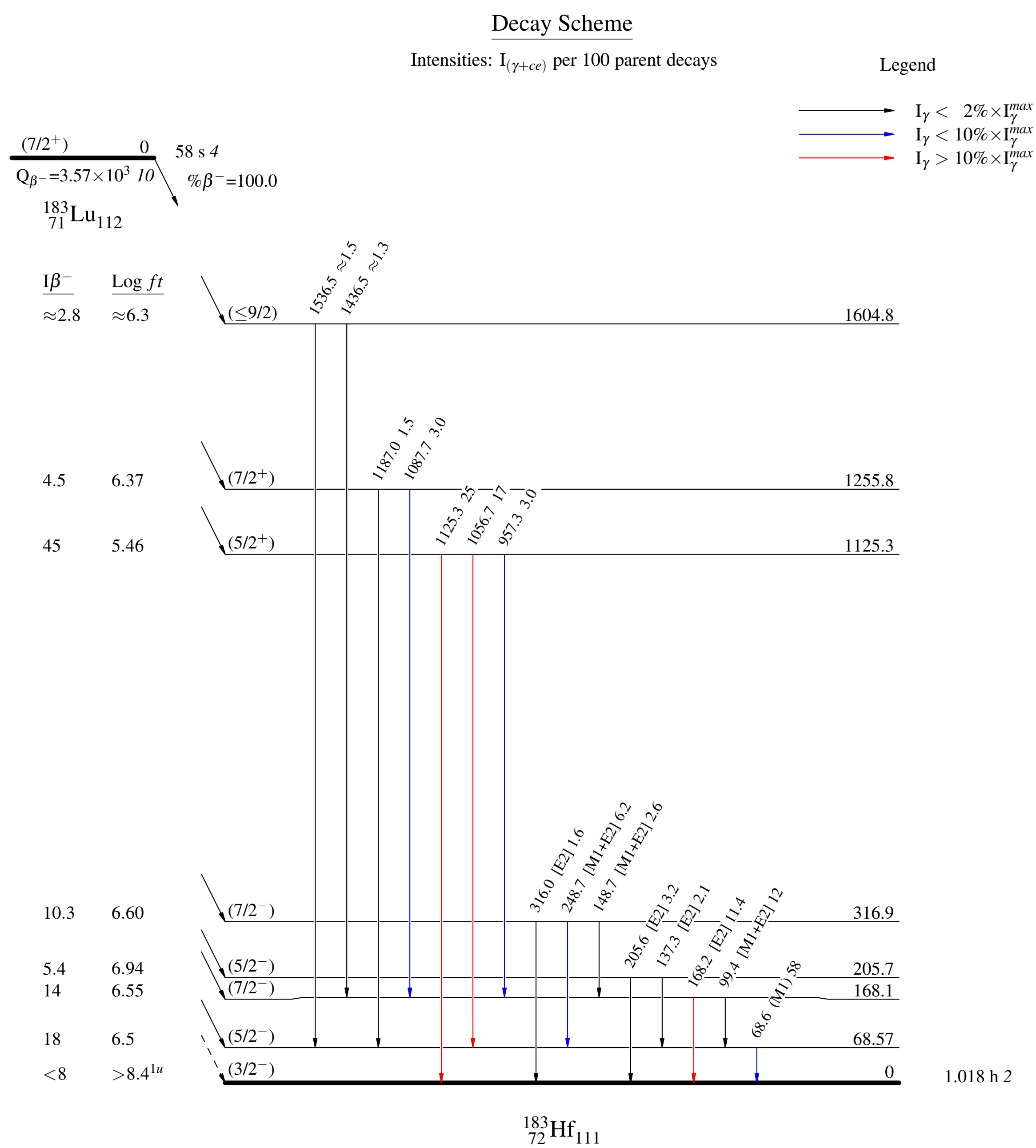

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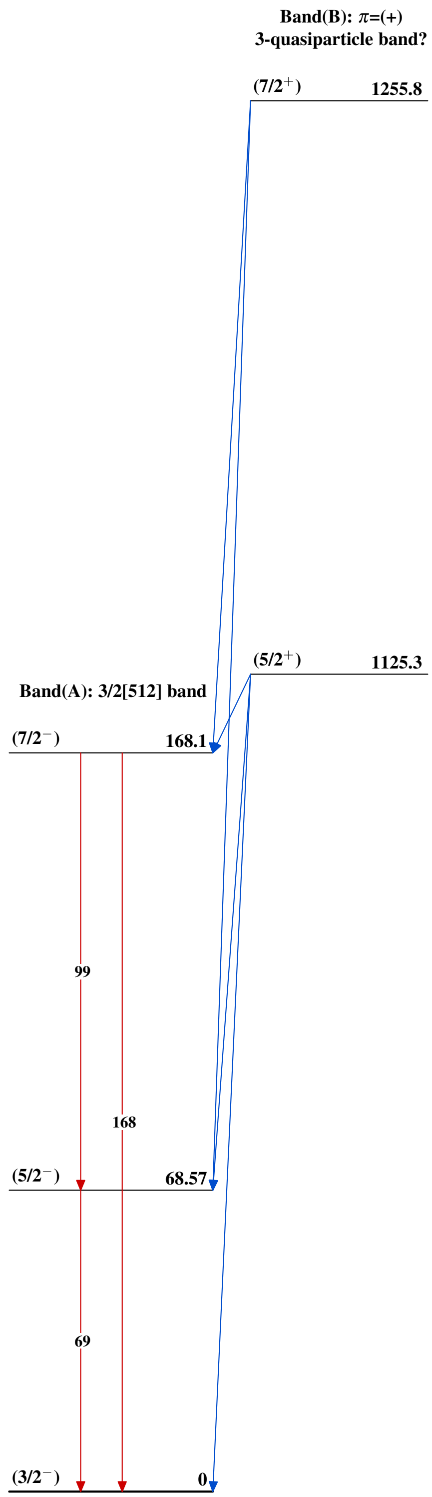

$^{183}_{72}Hf_{111}$