^{175}Hf ε decay 1988Si22,1969Jo16,1956Ha68

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 102, 719 (2004)	1-Jun-2004

Parent: ^{175}Hf: E=0; $J^{\pi}=5/2^{-}$; $T_{1/2}$=70 d *2*; Q(ε)=686.8 *19*; %ε decay=100.0

1988Si22: Ge. Measured γ, x rays.

1969Jo16:Ge(Li). Measured γ, ce, Xγ coincidences, cex coincidences. Source produce by ^{174}Hf(n,γ).

1956Ha68: crystal spectrometer. Measured γ and ce. Source produced by ^{174}Hf(n,γ).

Others: 1955Mi90, 1962Ba31, 1965Fu02, 1966Ha23, 1967Er01, 1968Ja11, 1969Ho18, 1976Pr03.

^{175}Lu Levels

E(level)†	J^{π}	$T_{1/2}$	Comments
0.0‡	$7/2^{+}$	stable	
113.81‡ *2*	$9/2^{+}$	90 ps *10*	$T_{1/2}$: from 1963Li05.
343.41# *8*	$5/2^{+}$	0.281 ns *10*	$T_{1/2}$: from 1991De24. Other value: 0.26 ns *2* (1969Ho18).
353.3@ *2*	$5/2^{-}$	1.49 μs *7*	$T_{1/2}$: from 1969Jo16.
371?@ *1*	$(1/2^{-})$		
432.8# *1*	$7/2^{+}$	<0.1 ns	$T_{1/2}$: from 1969Ho18.
514.6@ *3*	$3/2^{-}$		

† Deduced by evaluator from a least-squares fit to γ-ray energies.
‡ 7/2(404) band.
# 5/2(402) band.
@ 1/2(541) band.

ε radiations

E(decay)	E(level)	Iε†	Log *ft*	Comments
(172.2 *19*)	514.6	0.05 *2*	9.4 *3*	εK= 0.69 *4*; εL= 0.233 *8*; εM+= 0.078 *3*
(254.0 *19*)	432.8	17 *3*	7.3 *1*	εK= 0.751 *23*; εL= 0.188 *5*; εM+= 0.0607 *14*
(333.5 *19*)	353.3	0.19 *1*	9.58 *4*	εK= 0.776 *17*; εL= 0.170 *3*; εM+= 0.0541 *10*
(343.4 *19*)	343.41	80 *3*	7.00 *3*	εK= 0.778 *16*; εL= 0.169 *3*; εM+= 0.0535 *9*
(686.8‡ *19*)	0.0	≤7	≥8.7	εK= 0.809 *8*; εL= 0.1460 *13*; εM+= 0.0452 *4* Based on the experimental ratio K x ray/343g=0.79 *10* (1968Ja11), evaluator estimated an upper limit of 7% (with a 90% confidence level) for the g.s. ε feeding. A value of K x ray/343g=1.1 *3*, which disagrees with the experimental ratio of 1968Ja11, can be deduced from the decay scheme. An upper limit of 10% for the g.s. ε feeding was reported by 1955Mi90.

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

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γ(^{175}Lu)

Iγ normalization: From decay scheme assuming≤7% ε feeding to g.s., and using Ti(g.s.)=97%.

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[b]	Comments
89.36 *1*	2.86 *22*	432.8	7/2$^+$	343.41	5/2$^+$	M1+E2	+0.12 *1*	5.22	α(K)= 4.31; α(L)= 0.708; α(M)= 0.160; α(N+..)= 0.0471 Mult.: from α(K)exp=3.9 *4* and L1:L2:L3=78 *20*:10:4.3 1.4 (1968Ja11). δ: from 1976Kr21.
113.81 *2*	0.35 *3*	113.81	9/2$^+$	0.0	7/2$^+$	M1+E2	+0.464 *5*	2.51	α(K)= 1.92; α(L)= 0.455; α(M)= 0.106; α(N+..)= 0.0300 Mult and δ: from ^{175}Yb β$^-$ decay.
143.9[#]		514.6	3/2$^-$	371?	(1/2$^-$)				
161.3 *2*	0.027[&] *10*	514.6	3/2$^-$	353.3	5/2$^-$	M1		0.969	α(K)= 0.808; α(L)= 0.125; α(M)= 0.0278; α(N+..)= 0.00763 Mult.: from α(K)exp=0.84 *30* and K/L=5.7 *22* (1969Jo16).
229.6 *6*	0.813 *20*	343.41	5/2$^+$	113.81	9/2$^+$	E2		0.178	α(K)= 0.114; α(L)= 0.0492; α(M)= 0.0119; α(N+..)= 0.00345 Mult.: from α(K)exp=0.081 *20*, K/L=2.3 *4* (1969Jo16) and K:L2:L3:M=100:25:14:10 (1966Ha23).
318.9 *6*	0.20[&] *5*	432.8	7/2$^+$	113.81	9/2$^+$	M1+E2	+0.146 *12*	0.147	α(K)= 0.123; α(L)= 0.0187; α(M)= 0.00420; α(N+..)= 0.00142 Mult.: α(K)exp=0.11 and K/L=5 *2* (1969Jo16) and K:L1:M=10:1.6:0.6 (1966Ha23). δ: from 1976Kr21.
343.40 *8*	100	343.41	5/2$^+$	0.0	7/2$^+$	M1+E2	−0.27 *2*	0.118	α(K)= 0.0979; α(L)= 0.0151; α(M)= 0.00340; α(N+..)= 0.00115 Mult.: from α(K)exp=0.090 *4* (weighted average of 0.102 *8* (1962Ba31), 0.092 *5* (1966Se01) and 0.086 *4* (1967Er01)) and α(L1)exp=0.0121 *5* α(L2)exp=0.00115 *7* and α(L3)exp=0.00028 *2* (1967Er01). δ: from 1976Kr21.
353.3[@] *2*	0.272 *20*	353.3	5/2$^-$	0.0	7/2$^+$	E1		0.0140	α(K)= 0.0118; α(L)= 0.00173; α(M)= 0.000384; α(N+..)= 0.000131 Mult.: from α(K)exp=0.013 *2* (1967Er01).
433.0 *5*	1.71 *3*	432.8	7/2$^+$	0.0	7/2$^+$	M1		0.0663	α(K)= 0.0555; α(L)= 0.00832; α(M)= 0.00186; α(N+..)=

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γ(^{175}Lu) (continued)

E_γ[†]	E_i(level)	Comments
	0.000598	Mult.: from α(K)exp=0.043 *9* (1967Er01).

† From 1956Ha68, except as noted.
‡ From 1988Si22, except as noted.
# From 1966Ha23.
@ From 1976Pr03.
& From 1969Jo16.
[a] For absolute intensity per 100 decays, multiply by 0.84 *3*.
[b] 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.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays