^{184}Lu β^- decay (19 s) 1989Ry04,1995Kr04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 111,275 (2010)	1-Oct-2009

Parent: ^{184}Lu: E=0.0; $J^\pi=(3^+)$; $T_{1/2}$=19 s *2*; Q(β^-)=5090 *SY*; %β^- decay=100.0

1989Ry04: sources produced using ^{136}Xe, ^{186}W and ^{238}U beams on natural W + ^{181}Ta stacked targets. The cross section for ^{136}Xe(8.5 MeV/nucleon)+W to produce ^{184}Lu was measured to Be 0.53 mb. Sources were mass separated on-line, and activity was assigned to Lu decay on the basis of low efficiency for Hf in the separator. However, 48 s ^{184}Hf(8^-) was also present In sources (see 1995Kr04). Measured Eγ, Iγ, Eβ, $\gamma\gamma$ coin, $\beta\gamma$ coin, $\beta\gamma\gamma$(t); plastic scin, two Ge detectors.

1995Kr04: ^{136}Xe (11.4 MeV/nucleon) bombardment of ^{nat}W; on-line mass separation; β detector, two Ge detectors; measured Eγ, Iγ, $\gamma\gamma$ coin, $\beta^-\gamma$ coin, γ(t) for mixed ^{184}Lu and isomeric ^{184}Hf source.

^{184}Hf Levels

E(level)†	J^π‡
0.0	0^+
107.1 *1*	(2^+)
349.60 *23*	(4^+)

† From Eγ.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-‡	Log *ft*†	Comments
(4740 *SY*)	349.60	13 *9*	6.7 *4*	av Eβ=1.97×10^3 *18* Additional information 1.
(4982 *SY*)	107.1	86 *21*	5.97 *20*	av Eβ=2.08×10^3 *18*

† Calculated from intensity imbalance assuming an uncertainty of 400 keV In Q(β^-).
‡ Absolute intensity per 100 decays.

$\gamma(^{184}Hf)$

Iγ normalization: normalized assuming Σ (I(γ+ce) to g.s.)=100, i.e., No β^- branch to 0^+ g.s. (because ΔJ=(3)).

E$_\gamma$†	I$_\gamma$‡#	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.	α@	Comments
107.1 *1*	0.35 *5*	107.1	(2^+)	0.0	0^+	[E2]	2.70	α(K)=0.828 *12*; α(L)=1.426 *21*; α(M)=0.356 *6*; α(N+..)=0.0929 *14* α(N)=0.0824 *12*; α(O)=0.01045 *16*; α(P)=5.08×10^{-5} *8* other Eγ: 107.3 *3* (1989Ry04). Iγ: The authors' value of Iγ=120 *30* includes the contribution from ^{184}Hf isomer also present In the source. coincident with Hf(K x ray) and E$\beta\geq$450 keV (1989Ry04).
242.5 *2*	0.15 *9*	349.60	(4^+)	107.1	(2^+)	[E2]	0.1531	α(K)=0.0981 *14*; α(L)=0.0420 *6*; α(M)=0.01023 *15*; α(N+..)=0.00271 *4* α(N)=0.00239 *4*; α(O)=0.000318 *5*; α(P)=6.71×10^{-6} *10* other Eγ: 242.5 *3* (1989Ry04).

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$\gamma(^{184}Hf)$ (continued)

† From 1995Kr04. Data from 1989Ry04 are In excellent agreement.

‡ Based on I(γ+ce) (1995Kr04) for mixed ^{184}Lu and ^{184}Hf(48 s) source. absence of $\beta^-368\gamma$ coin from that source (1995Kr04) implies No β^- decay branch to levels above the 350 level. the observed relative intensities for the 107γ and 243γ have been corrected for contributions from IT decay As detailed In comments on those gammas In the ^{184}Hf IT decay data set.

For absolute intensity per 100 decays, multiply by 77 *11*.

@ 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