^{177}Lu β^- decay (6.6443 d) 2012Ko24

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

Parent: ^{177}Lu: E=0.0; $J^\pi=7/2^+$; $T_{1/2}$=6.6443 d *9*; Q(β^-)=496.8 *8*; %β^- decay=100.0

Data taken from: 1949Do05, 1950An75, 1954Fr42, 1955Ma12, 1955Ry53, 1956Wi39, 1957Of04, 1958Al97, 1960Bo02, 1960Ma03, 1960Va12, 1961Ha38, 1961Sp09, 1961We11, 1962Be46, 1962Bo27, 1962El02, 1962Ma42, 1962Ma53, 1962Si07, 1963Li05, 1964Al04, 1964Cr02, 1964No08, 1965Ma18, 1965Ro17, 1966Bl05, 1966Ha04, 1966He01, 1967Ha09, 1968Br15, 1968Mu12, 1968Ra25, 1968To07, 1969Gu15, 1970Hr01, 1971Ho37, 1972Gr35, 1972Ho39, 1972Ho54, 1973GoYH, 1974Ag01, 1974Kr12, 1977Ke12, 1981Hn03, 1983Lu08, 1987Me17, 1991De24, 1992De53, 2001Sc23, 2010Di18, 2011De07, 2012Ko24, 2016Lu16, 2016Dr15.

For measured X-ray intensities see: 2016Lu16, 2011De07 and 2001Sc23.

^{177}Hf Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]
0.0[#]	$7/2^-$	stable
112.9498[#] *4*	$9/2^-$	0.541 ns *14*
249.6744[#] *4*	$11/2^-$	107 ps *10*
321.3162[@] *4*	$9/2^+$	0.665 ns *16*

[†] From a least-squares fit to Eγ.
[‡] From Adopted Levels.
[#] Band(A): $K^\pi=7/2^-$, ν7/2[514] band.
[@] Band(B): $K^\pi=9/2^+$, ν9/2[624] band.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(175.5 *8*)	321.3162	11.66 *11*	6.069 *8*	av Eβ=47.23 *23* E(decay): Other: 174 *3* (1962El02). Iβ^-: 6.72% *25* (1962El02).
(247.1 *8*)	249.6744	0.016 *13*	9.0[1u] *4*	av Eβ=78.12 *27* E(decay): Other: 249 *4* (1962El02). Iβ^-: Other: 0.31% *6* (1962El02) and 0.2% (1956Wi39).
(383.9 *8*)	112.9498	8.89 *24*	7.273 *12*	av Eβ=111.20 *26* E(decay): Other: 385 *2* (1962El02). Iβ^-: 2.95% *5* (1962El02).
(496.8 *8*)	0.0	79.44 *23*	6.692 *3*	av Eβ=148.84 *28* E(decay): Others: 496.8 keV *17* (1962El02). Iβ^-: 90% *4* (1962El02).

[†] From total (photon and conversion electron) intensity balances.
[‡] Absolute intensity per 100 decays.

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$\gamma(^{177}Hf)$

Iγ normalization: From the decay scheme and Iγ(208.3662γ)=10.41% *4*, weighted average of 10.38% *9* (2016Dr15), 10.80% *35* (2016Lu16), 10.55% *9* (2012Ko24), 10.35% *8* (2010Di18), 10.36% *7* (2001Sc23), 10.7% *5* (1964Cr02) and 11.4% *6* (1961We11).

E_γ [†]	I_γ [#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[‡]	Comments
71.6418 *6*	1.58 *5*	321.3162	9/2$^+$	249.6744	11/2$^-$	E1+M2	−0.018 *9*	0.89 *6*	%Iγ=0.164 *5* α(K)=0.71 *4*; α(L)=0.136 *14*; α(M)=0.031 *4* α(N)=0.0072 *9*; α(O)=0.00101 *12*; α(P)=4.5×10^{-5} *7* I_γ: From Iγ(71.6418γ)/Iγ(208.3662γ)=0.0158 *4* in Adopted Gammas and Iγ(208.3662γ)=100.
112.9498 *4*	59.80 *26*	112.9498	9/2$^-$	0.0	7/2$^-$	M1+E2	−4.77 *19*	2.23	%Iγ=6.23 *4* α(K)=0.805 *13*; α(L)=1.085 *16*; α(M)=0.270 *4* α(N)=0.0627 *9*; α(O)=0.00798 *12*; α(P)=5.14×10^{-5} *9* I_γ: Weighted average of 60.0 *5* (2016Dr15), 59.0 *7* (2012Ko24), 60.1 *5* (2010Di18), 59.6 *6* (2001Sc23), 59.6 *8* (1987Me17), 60 *5* (1974Ag01), 61 *4* (1967Ha09), 58 *4* (1964Al04) and 62 *2* (1961We11). Others: 55 *5* (2016Lu16), 62.15 *5* (2011De07) and 45.5 (1955Ma12).
136.7245 *5*	0.4463 *36*	249.6744	11/2$^-$	112.9498	9/2$^-$	M1+E2	−3.31 *15*	1.130 *17*	%Iγ=0.0465 *4* α(K)=0.540 *10*; α(L)=0.450 *7*; α(M)=0.1113 *17* α(N)=0.0259 *4*; α(O)=0.00334 *5*; α(P)=3.57×10^{-5} *9* I_γ: From Iγ(136.7245γ)/Iγ(249.6742γ)=0.2327 *19* in the Adopted Gammas and Iγ(249.6742γ)=1.918 *10*. Measured values are: 0.32 *2* (2016Lu16), 0.466 *12* (2012Ko24), 0.543 *6* (2011De07), 0.448 *8* (2001Sc23), 0.457 *6* (1987Me17), 0.52 *5* (1974Ag01), 0.56 *4* (1967Ha09), 0.43 *3* (1964Al04) and 0.47 *15* (1961We11).
208.3662 *4*	100	321.3162	9/2$^+$	112.9498	9/2$^-$	E1+M2	+0.076 *19*	0.068 *9*	%Iγ=10.41 *4* α(K)=0.055 *7*; α(L)=0.0094

Continued on next page (footnotes at end of table)

^{177}Lu β^- decay (6.6443 d) 2012Ko24 (continued)

$\gamma(^{177}Hf)$ (continued)

E_γ[†]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[‡]	Comments
									15; α(M)=0.0022 *4* α(N)=0.00051 *9*; α(O)=7.5×10^{-5} *13*; α(P)=4.3×10^{-6} *8* I_γ: Used for normalization.
249.6742 *6*	1.918 *10*	249.6744	11/2$^-$	0.0	7/2$^-$	E2		0.1395	%Iγ=0.1997 *13* α(K)=0.0905 *13*; α(L)=0.0375 *6*; α(M)=0.00911 *13* α(N)=0.00213 *3*; α(O)=0.000284 *4*; α(P)=6.23×10^{-6} *9* I_γ: Weighted average of 1.918 *12* (2012Ko24), 1.918 *17* (2001Sc23), 1.9 *2* (1974Ag01), 1.83 *12* (1967Ha09), 1.93 *14* (1964Al04) and 2.00 *20* (1961We11). Others: 1.74 *5* (2016Lu16), 1.982 *4* (2011De07), 2.00 *2* (1987Me17) and 1.36 (1955Ma12).
321.3159 *6*	2.10 *3*	321.3162	9/2$^+$	0.0	7/2$^-$	E1+M2	+0.175 *10*	0.0354 *21*	%Iγ=0.2186 *32* α(K)=0.0289 *16*; α(L)=0.0050 *4*; α(M)=0.00116 *8* α(N)=0.000274 *18*; α(O)=4.1×10^{-5} *3*; α(P)=2.52×10^{-6} *17* I_γ: From Iγ(321.3159γ)/Iγ(208.3662γ)=0.0210 *3* in Adopted Gammas and Iγ(208.3662γ)=100.

[†] From adopted gammas.
[‡] Additional information 1.
[#] For absolute intensity per 100 decays, multiply by 0.1041 *4*.

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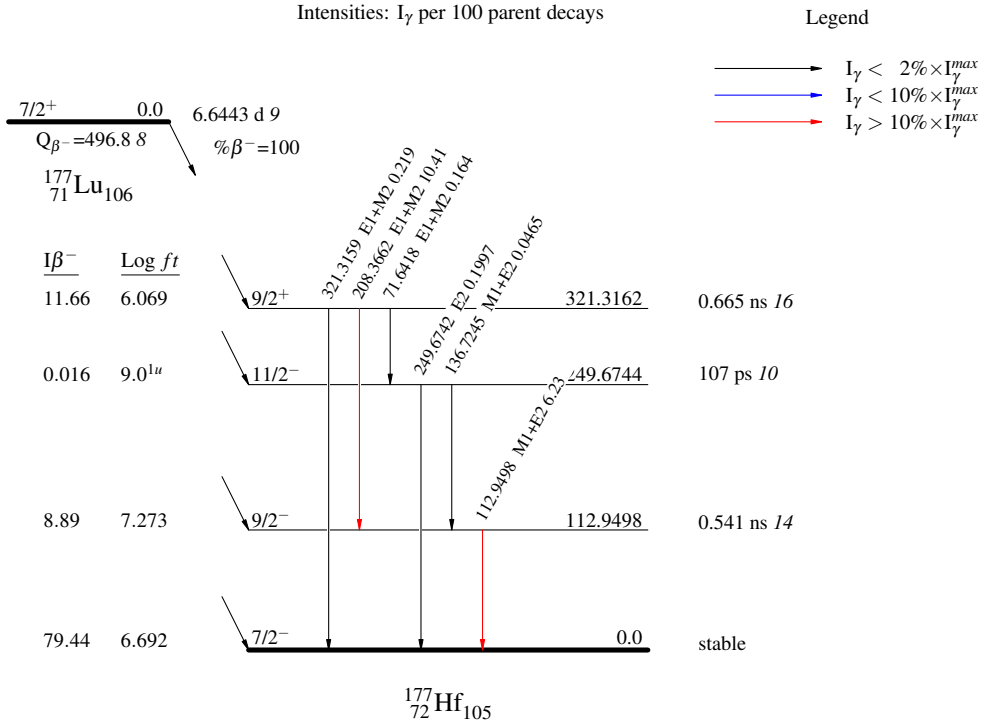
Decay Scheme

Intensities: I_γ per 100 parent decays



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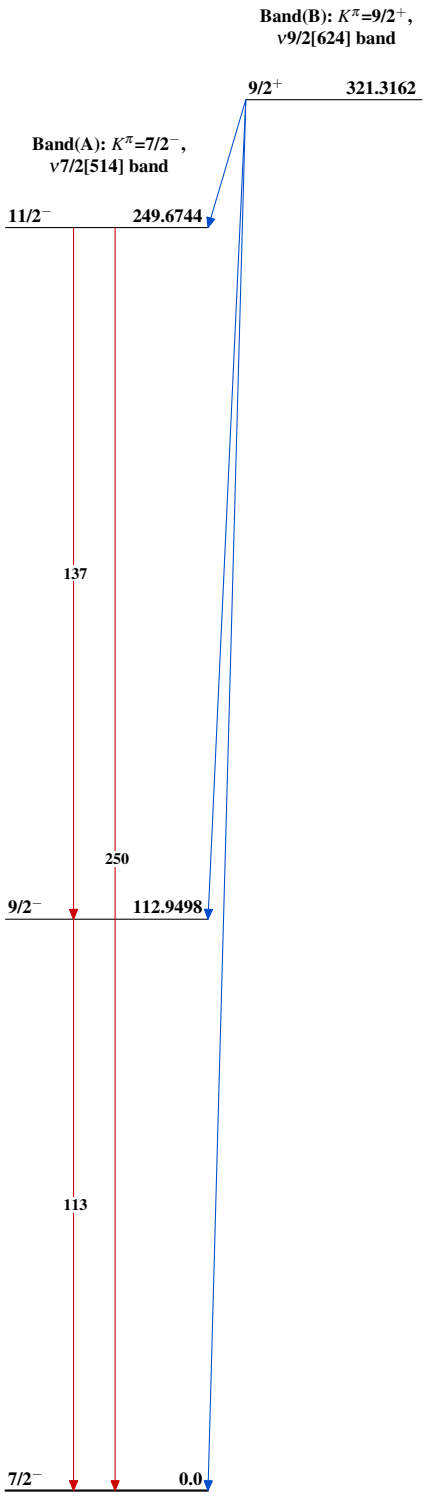

$^{177}_{72}Hf_{105}$