

^{176}Lu β^- decay (3.664 h) 1981Lo12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 791 (2006)	15-Sep-2005

Parent: ^{176}Lu : E=123.0 14; $J^\pi=1^-$; $T_{1/2}=3.664$ h 19; $Q(\beta^-)=1190.2$ 8; % β^- decay=100.0

 ^{176}Hf Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0.0	0 ⁺		
88.361 9	2 ⁺	1.39 ns 4	$T_{1/2}$: from 1963Fo02.
290.54 16	4 ⁺		
1149.78 8	0 ⁺		
1226.66 11	2 ⁺		
1247.62 6	2 ⁻		
1293.07 18	0 ⁺		

[†] From a least squares fit to the γ -ray energies.

[‡] From Adopted Levels.

 β^- radiations

E(decay)	E(level)	$I\beta^-$ ^{†‡}	Log ft	Comments
(20.1 16)	1293.07	9.3×10^{-5} 7	6.82 13	av $E\beta^- = 5.7$ 4
(65.6 16)	1247.62	0.00146 4	7.07 5	av $E\beta^- = 17.5$ 4
(86.5 16)	1226.66	0.00059 2	7.82 4	av $E\beta^- = 23.1$ 5
(163.4 16)	1149.78	0.00077 3	8.54 3	av $E\beta^- = 44.5$ 5
1222 10	88.361	61 2	6.54 2	av $E\beta^- = 425.2$ 7 E(decay): from 1962Re08. $I\beta^-$: directly measured intensities: % $I\beta^-$ =60.4 61 (1964He17), % $I\beta^-$ =65 10 (1962Re08), % $I\beta^-$ =56 3 (1963Ra14).
1317 1	0.0	39 2	6.85 3	av $E\beta^- = 461.2$ 7 E(decay): from 1973Va11. Other values: 1314 keV 8 (1962Re08), 1319 keV 5 (1963Ra14). Others: 1963Ga13, 1952Sc08. $I\beta^-$: directly measured intensities: % $I\beta^-$ =35 10 (1962Re08), % $I\beta^-$ =44 3 (1963Ra14), % $I\beta^-$ =39.6 61 (1964He17).

[†] From γ -ray transition intensity balances.

[‡] Absolute intensity per 100 decays.

 $\gamma(^{176}\text{Hf})$

I_γ normalization: From % $I_\gamma(88\gamma)=8.90$ 15, measured with a calibrated Ge(Li) detector, using sources prepared from a standardized ^{176}Lu (3.635 h) solution (1981Lo12).

$\beta\gamma(\theta)$: 1973Va11, 1962Re08.

$I_\gamma(K\alpha \text{ x ray})=5.68 \times 10^5$ 16; $I_\gamma(K\beta \text{ x ray})=1.57 \times 10^5$ 6 (1981Lo12). Others: 1971Ge11, 1972De67, 1971Be10. $I_\gamma(K\alpha \text{ x ray})=5.86 \times 10^5$ 24; $I_\gamma(K\beta \text{ x ray})=1.53 \times 10^5$ 6, deduced by evaluator from γ -ray intensities, K-conversion coefficients, and using a K-fluorescence yield of 0.955 from 1979Kr13.

Continued on next page (footnotes at end of table)

$^{176}\text{Lu} \beta^-$ decay (3.664 h) **1981Lo12** (continued) $\gamma(^{176}\text{Hf})$ (continued)

E_γ^\dagger	$I_\gamma^{\dagger@}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	$\alpha^\#$	Comments
88.361 9	6.4×10^5 3	88.361	2 ⁺	0.0	0 ⁺	E2	5.86	E_γ : from bent-crystal measurement of 1962Ha46 . Mult.: from $\alpha(\text{K})_{\text{exp}}=1.18$ 12 (1971Ge11) and ce(L1):ce(L2):ce(L3) exp = 8.7 9: 104 2: 100 (1966Ha08 , 1966St01). Others: 1952Mi18 , 1952Sc08 , 1957Mc34 , 1961Re09 , 1962Fo15 , 1962Re08 , 1964He17 , 1964Th02 , 1965Av01 , 1966Ba30 .
202.2 3	≤ 50	290.54	4 ⁺	88.361	2 ⁺	E2	0.280	I_γ : $I_\gamma=15$ 1 from transition-intensity balance about 290 level.
936.25 20	15.8 9	1226.66	2 ⁺	290.54	4 ⁺	E2	0.00472	
956.8 3	3.2 4	1247.62	2 ⁻	290.54	4 ⁺	M2+E3	0.017 7	$\alpha(\text{K})= 0.014$ 6; $\alpha(\text{L})= 0.0024$ 9
1061.42 8	54.8 18	1149.78	0 ⁺	88.361	2 ⁺	E2	0.00366	
1138.25 15	16.8 11	1226.66	2 ⁺	88.361	2 ⁺	E0+E2	≈ 0.037	α : experimental value from ^{176}Ta ε decay.
1159.26 7	100.0 25	1247.62	2 ⁻	88.361	2 ⁺		0.0034	α : experimental value from ^{176}Ta ε decay.
1204.70 18	6.7 5	1293.07	0 ⁺	88.361	2 ⁺	(E2)	0.00285	
1226.61 16	9.5 5	1226.66	2 ⁺	0.0	0 ⁺	(E2)	0.00275	
1247.62 9	1.5 3	1247.62	2 ⁻	0.0	0 ⁺	M2	0.0118	$\alpha(\text{K})= 0.0094$ 4; $\alpha(\text{L})= 0.0023$ 8 Measured M2(+E3) multipolarity. Level scheme requires M2.

[†] From [1981Lo12](#), unless otherwise specified.

[‡] From adopted gammas, unless otherwise specified.

[#] Conversion coefficients for γ -rays with mixed multiplicities and no δ given are average values for the individual multiplicities, unless otherwise specified.

[@] For absolute intensity per 100 decays, multiply by 1.391×10^{-5} 23.

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Decay Scheme

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

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$

