^{166}Lu ε decay (1.41 min) 1974De09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

Parent: ^{166}Lu: E=34.37 *22*; $J^\pi=3^{(-)}$; $T_{1/2}$=1.41 min *10*; Q(ε)=5570 *30*; %ε+%$β^+$ decay=58 *5*

^{166}Yb Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0	0^+	1039.16 *5*	$(3)^+$	1451.40 *20*		1744.25 *7*	$(3^+,4^+)$
102.38 *3*	2^+	1162.84 *8*	$(4)^+$	1503.37 *7*	(2^-)	2029.29 *7*	$(3^-,4^-)$
330.50 *4*	4^+	1315.32 *15*		1607.93 *10*	$(2^+,3,4^+)$		
932.37 *5*	$(2)^+$	1386.02 *11*	$(2^+,3,4^+)$	1684.84 *15*	$(2^+,3,4^+)$		

† From least-squares fit to Eγ.
‡ From Adopted Levels.

ε,$β^+$ radiations

Iε,log *ft* The total intensity of γ rays not placed in the decay scheme is 7%; consequently, Iε and log *ft* values are shown for only the strongest branches, and the values for the 2029 level alone can Be considered to Be reliable.

E(decay)	E(level)	Iβ+ †	Iε†	Log *ft*	I(ε+β+)†	Comments
(3.58×10³ *3*)	2029.29	7.6 *17*	15 *3*	4.99 *10*	23 *5*	av Eβ=1154 *14*; εK=0.556 *7*; εL=0.0871 *11*; εM+=0.0262 *4*
(3.86×10³ *3*)	1744.25	1.2 *4*	1.7 *7*	6.01 *17*	2.9 *11*	av Eβ=1283 *14*; εK=0.495 *7*; εL=0.0773 *10*; εM+=0.0232 *3*
(4.15×10³‡ *3*)	1451.40	0.86 *24*	0.9 *3*	6.33 *13*	1.8 *5*	av Eβ=1417 *14*; εK=0.435 *6*; εL=0.0679 *10*; εM+=0.0204 *3*
(4.29×10³ *3*)	1315.32	1.8 *5*	1.8 *4*	6.09 *12*	3.6 *9*	av Eβ=1479 *14*; εK=0.409 *6*; εL=0.0637 *9*; εM+=0.0192 *3*
(4.57×10³ *3*)	1039.16	1.3 *6*	1.0 *5*	6.39 *21*	2.3 *11*	av Eβ=1606 *14*; εK=0.360 *5*; εL=0.0560 *8*; εM+=0.01683 *24*
(4.67×10³ *3*)	932.37	3.1 *9*	2.2 *6*	6.07 *13*	5.3 *15*	av Eβ=1656 *14*; εK=0.342 *5*; εL=0.0532 *8*; εM+=0.01599 *23*

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

γ(^{166}Yb)

Iγ normalization: The basis of the intensity normalization is that no ε+$β^+$ feeding to the ground state of ^{166}Yb is expected (ΔJ=3), so Σ (I(γ+ce) to g.s.) =100.

Eγ	Iγ‡	Ei(level)	J_i^π	Ef	J_f^π	Mult.†	α#	Comments
102.38 *3*	114 *27*	102.38	2^+	0.0	0^+	E2	2.93	α(K)=0.968 *14*; α(L)=1.501 *22*; α(M)=0.370 *6*; α(N+..)=0.0941 *14* α(N)=0.0844 *12*; α(O)=0.00970 *14*; α(P)=4.10×10^{-5} *6*
152.49 *13*	13 *1*	1315.32		1162.84	$(4)^+$			

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^{166}Lu ε decay (1.41 min) 1974De09 (continued)

γ(^{166}Yb) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
228.13 *3*	138 *40*	330.50	4^+	102.38	2^+	E2		0.1742	α(K)=0.1135 *16*; α(L)=0.0466 *7*; α(M)=0.01121 *16*; α(N+..)=0.00290 *4* α(N)=0.00258 *4*; α(O)=0.000314 *5*; α(P)=5.47×10^{-6} *8*
285.07 *5*	100 *5*	2029.29	$(3^-,4^-)$	1744.25	$(3^+,4^+)$	E1		0.0226	α(K)=0.0190 *3*; α(L)=0.00281 *4*; α(M)=0.000625 *9*; α(N+..)=0.0001665 *24* α(N)=0.0001455 *21*; α(O)=2.01×10^{-5} *3*; α(P)=9.57×10^{-7} *14* Mult.: from α(K)exp=0.026 *20* (1974De09).
345.0[@&] *6*	4[@] *1*	1386.02	$(2^+,3,4^+)$	1039.16	$(3)^+$				
345.0[@] *6*	4[@] *1*	2029.29	$(3^-,4^-)$	1684.84	$(2^+,3,4^+)$				
[x]407.0 *6*	4 *2*								
412.20 *20*	11 *1*	1451.40		1039.16	$(3)^+$				
421.26 *9*	19 *1*	2029.29	$(3^-,4^-)$	1607.93	$(2^+,3,4^+)$				
464.29 *7*	7 *2*	1503.37	(2^-)	1039.16	$(3)^+$				
[x]470.4 *5*	5 *2*								
526.01 *10*	27 *3*	2029.29	$(3^-,4^-)$	1503.37	(2^-)				
568.5 *6*	7 *3*	1607.93	$(2^+,3,4^+)$	1039.16	$(3)^+$				
570.93 *9*	29 *3*	1503.37	(2^-)	932.37	$(2)^+$				
[x]581.0 *6*	11 *3*								
[x]625.3 *6*	6 *2*								
643.20 *10*	32 *3*	2029.29	$(3^-,4^-)$	1386.02	$(2^+,3,4^+)$				
[x]680.9 *4*	6 *2*								
[x]701.9 *3*	9 *1*								
705.08 *11*	40 *4*	1744.25	$(3^+,4^+)$	1039.16	$(3)^+$				
708.82 *13*	13 *4*	1039.16	$(3)^+$	330.50	4^+	(E2)		0.00774	α(K)=0.00631 *9*; α(L)=0.001113 *16*; α(M)=0.000253 *4*; α(N+..)=6.75×10^{-5} *10* α(N)=5.91×10^{-5} *9*; α(O)=8.08×10^{-6} *12*; α(P)=3.53×10^{-7} *5*
[x]747.1 *5*	4 *1*								
811.92 *6*	89 *5*	1744.25	$(3^+,4^+)$	932.37	$(2)^+$				
830.06 *9*	93 *5*	932.37	$(2)^+$	102.38	2^+	M1		0.01134	α(K)=0.00956 *14*; α(L)=0.001387 *20*; α(M)=0.000309 *5*; α(N+..)=8.35×10^{-5} *12* α(N)=7.25×10^{-5} *11*; α(O)=1.042×10^{-5} *15*; α(P)=5.67×10^{-7} *8*
832.49 *10*	24 *8*	1162.84	$(4)^+$	330.50	4^+	M1+E2	+0.6 *2*	0.0097 *8*	α(K)=0.0082 *7*; α(L)=0.00121 *9*; α(M)=0.000270 *18*; α(N+..)=7.3×10^{-5} *5*

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^{166}Lu ε decay (1.41 min) 1974De09 (continued)

γ(^{166}Yb) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[#]	Comments
								α(N)=6.3×10^{-5} *5*; α(O)=9.0×10^{-6} *7*; α(P)=4.8×10^{-7} *4*
866.4 *4*	11 *2*	2029.29	(3$^-$,4$^-$)	1162.84	(4)$^+$			
932.35 *7*	73 *5*	932.37	(2)$^+$	0.0	0$^+$			
936.79 *5*	75 *5*	1039.16	(3)$^+$	102.38	2$^+$	E2	0.00424	α(K)=0.00352 *5*; α(L)=0.000564 *8*; α(M)=0.0001271 *18*; α(N+..)=3.40×10^{-5} *5* α(N)=2.97×10^{-5} *5*; α(O)=4.14×10^{-6} *6*; α(P)=1.98×10^{-7} *3*
984.6 *6*	20 *4*	1315.32		330.50	4$^+$			
[x]1023.8 *6*	6 *3*							
1054.7 *6*	8 *4*	1386.02	(2$^+$,3,4$^+$)	330.50	4$^+$			
1060.28 *11*	5 *2*	1162.84	(4)$^+$	102.38	2$^+$			
1276.92 *22*	11 *3*	1607.93	(2$^+$,3,4$^+$)	330.50	4$^+$			
1283.45 *21*	35 *7*	1386.02	(2$^+$,3,4$^+$)	102.38	2$^+$			
1349.4 *6*	5 *2*	1451.40		102.38	2$^+$			
1354.35 *15*	9 *9*	1684.84	(2$^+$,3,4$^+$)	330.50	4$^+$			
1504.9 *6*	11 *3*	1607.93	(2$^+$,3,4$^+$)	102.38	2$^+$			
1582.2 *6*	2 *2*	1684.84	(2$^+$,3,4$^+$)	102.38	2$^+$			
1698.7 *4*	12 *3*	2029.29	(3$^-$,4$^-$)	330.50	4$^+$			
[x]1801.3 *6*	9 *3*							
[x]1974.0 *6*	6 *3*							

[†] From Adopted Gammas.
[‡] For absolute intensity per 100 decays, multiply by 0.110 *23*.
[#] 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.
[@] Multiply placed with undivided intensity.
[&] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays
& Multiply placed: undivided intensity given

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence