Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Shaofei Zhu	NDS 182, 2 (2022).	1-Apr-2022

Q(β^-)=−3139 *SY*; S(n)=7352 *21*; S(p)=5430.5 *18*; Q(α)=5867.15 *8* 2021Wa16
ΔQ(β^-)=120 (2021Wa16).
S(2n)=13591 *7*, S(2p)=9821.4 *16* (2021Wa16).
α: Additional information 1.

^{236}Pu Levels

Cross Reference (XREF) Flags

A	^{236}Np β^- decay (155×10^3 y)	E	^{236}Am ε decay (2.9 min)
B	^{236}Np β^- decay (22.5 h)	F	^{235}U(α,3nγ)
C	^{240}Cm α decay	G	^{237}Np(^{209}Bi,^{210}Pbγ)
D	^{236}Am ε decay (3.6 min)		

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0#	0$^+$	2.858 y *8*	ABCDEFG	%α=100; %SF=1.9×10^{-7} *4* %SF: from T$_{1/2}$(SF)=1.5×10^9 y *3* as unweighted average of 3.5×10^9 y *10* (1952Gh27), 2.09×10^9 y *6* (1988SeZY), 1.36×10^9 y *20* (1990Og01,1995Hu21) and 1.13×10^9 y *13* (1995Hu21). T$_{1/2}$: weighted average of 2.851 y *8* (1957Ho66) and 2.866 y *9* (1984Na30). Other value: 2.7 y *3* (1949Ja01). ^{236}Pu decay by ^{28}Mg emission observed by 1995Hu21 (15 tracks), 1990Og01 (two ^{28}Mg tracks). Partial T$_{1/2}$=1.06×10^{14} y *28* (1995Hu21), ≈1.5×10^{14} y (1990Og01). T$_{1/2}$(^{28}Mg, Calculated)= 4.12×10^{13} y (Cluster model,1994Bu07), 2.52×10^{12} y (Effective liquid drop model, 1993Go18).
44.63# *9*	2$^+$		ABCDEFG	
147.45# *9*	4$^+$		A CDEFG	
305.80# *10*	6$^+$		A CD FG	
515.70# *22*	8$^+$		FG	
698.31@ *12*	1$^-$		E	
758.02@ *17*	3$^-$		E	
773.5# *3*	10$^+$		FG	
866.00@ *15*	5$^-$		D	
1074.3# *4*	12$^+$		FG	
1185.45 *15*	5$^-$	1.2 μs *3*	D	%IT=100 J$^\pi$: M1 γ to 5$^-$; γ to 4$^+$ and 6$^+$; proposed as K-isomer with configuration=((π 5/2[523])(π 5/2[642])), K^π=5$^-$ (2005As01).
1311.51& *23*	(0$^-$)		E	J$^\pi$: from systematics with ^{240}Pu.
1340.82& *19*	(2$^-$)		E	J$^\pi$: from systematics with ^{240}Pu.
1413.6# *4*	14$^+$		FG	
1786.0# *5*	16$^+$		FG	
2188.0 *7*	18$^+$		G	
2615.7 *9*	20$^+$		G	
≈3.×10^3	(0$^+$)	37 ps *4*		%SF≤100 J$^\pi$: ground state in the second potential well from syst of fission isomers (1974MeYP,1977Me08). E(level): from ^{237}Np(p,2n) and ^{234}U(α,2n) (1974MeYP). T$_{1/2}$: from 1977Me08 using ^{234}U(α,2n) reaction; other: 40 ps *15* (1974MeYP).

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Adopted Levels, Gammas (continued)

^{236}Pu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				Q(intrinsic)=37 b *+14–8* (1977Me08). %SF: no γ decay observed (1977Me08).
3063.7 *10*	22^+		G	
3529.6 *11*	24^+		G	
4.1×10^3 *2*		34 ns *8*		%SF≤100 E(level),$T_{1/2}$: from ^{237}Np(p,2n) (1969La14). Jπ: not determined, possible two-quasi-particle K-isomer in the second potential well from syst of fission isomers (1977Me08). %SF: no γ decay observed (1969La14).

† Deduced by the evaluator from a least-squares fit to γ-ray energies.
‡ From band structure, unless indicated otherwise.
# Band(A): $K^\pi=0^+$ g.s. rotational band. Band assignment from energy systematics (1983Ha31).
@ Band(B): $K^\pi=0^-$ octupole vibrational band. Assignment based on decay branching ratio to g.s. band (2005As01).
& Band(C): $K^\pi=0^-$ (π, 5/2[523])(π, 5/2[642]), from syst with ^{240}Pu (2005As01).

γ(^{236}Pu)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α	Comments
44.63	2^+	44.63 *10*	100	0	0^+	E2	741 *13*	α(L)=538 *10*; α(M)=150.1 *27*; α(N)=41.2 *7*; α(O)=9.69 *17*; α(P)=1.515 *27*; α(Q)=0.00326 *6* E_γ,I_γ,Mult.: from ^{236}Np β^- decay (22.5 h).
147.45	4^+	102.82 *2*	100	44.63	2^+	[E2]	13.87 *19*	α(L)=10.06 *14*; α(M)=2.82 *4*; α(N)=0.775 *11*; α(O)=0.1826 *26*; α(P)=0.0291 *4* α(Q)=0.0001055 *15* E_γ,I_γ: from ^{236}Np β^- decay (153×10^3 y).
305.80	6^+	158.35 *2*	100	147.45	4^+	E2	2.139 *30*	α(K)=0.1927 *27*; α(L)=1.413 *20*; α(M)=0.394 *6*; α(N)=0.1084 *15*; α(O)=0.0256 *4* α(P)=0.00414 *6*; α(Q)=2.465×10^{-5} *35* E_γ,I_γ: from ^{236}Np β^- decay (153×10^3 y). Mult.: from ^{235}U(α,3nγ).
515.70	8^+	209.9† *2*	100†	305.80	6^+	E2	0.714 *10*	α(K)=0.1402 *20*; α(L)=0.417 *6*; α(M)=0.1157 *17*; α(N)=0.0318 *5*; α(O)=0.00753 *11* α(P)=0.001235 *18*; α(Q)=1.096×10^{-5} *16* Mult.: from ^{235}U(α,3nγ).
698.31	1^-	653.68‡ *12*	100‡ *15*	44.63	2^+	[E1]	0.00865 *12*	α(K)=0.00699 *10*; α(L)=0.001254 *18*; α(M)=0.000300 *4*; α(N)=8.12×10^{-5} *11* α(O)=2.004×10^{-5} *28*; α(P)=3.72×10^{-6} *5*; α(Q)=2.229×10^{-7} *31*
		698.3‡ *2*	71‡ *11*	0	0^+	[E1]	0.00766 *11*	α(K)=0.00620 *9*; α(L)=0.001104 *15*; α(M)=0.000264 *4*; α(N)=7.15×10^{-5} *10* α(O)=1.765×10^{-5} *25*; α(P)=3.28×10^{-6} *5*; α(Q)=1.985×10^{-7} *28*
758.02	3^-	610.8‡ *3*	58‡ *11*	147.45	4^+	[E1]	0.00982 *14*	α(K)=0.00792 *11*; α(L)=0.001431 *20*; α(M)=0.000343 *5*; α(N)=9.28×10^{-5} *13* α(O)=2.289×10^{-5} *32*; α(P)=4.24×10^{-6} *6*; α(Q)=2.516×10^{-7} *35*
		713.3‡ *2*	100‡ *17*	44.63	2^+	[E1]	0.00737 *10*	α(K)=0.00597 *8*; α(L)=0.001060 *15*;

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Adopted Levels, Gammas (continued)

γ(^{236}Pu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α	Comments
								α(M)=0.000254 *4*; α(N)=6.86×10^{-5} *10* α(O)=1.694×10^{-5} *24*; α(P)=3.15×10^{-6} *4*; α(Q)=1.912×10^{-7} *27*
773.5	10$^+$	257.8† *2*	100†	515.70	8$^+$	[E2]	0.346 *5*	α(K)=0.1006 *14*; α(L)=0.1785 *26*; α(M)=0.0492 *7*; α(N)=0.01350 *19*; α(O)=0.00321 *5* α(P)=0.000532 *8*; α(Q)=6.41×10^{-6} *9*
866.00	5$^-$	560.3# *2*	43# *8*	305.80	6$^+$	[E1]	0.01156 *16*	α(K)=0.00931 *13*; α(L)=0.001699 *24*; α(M)=0.000408 *6*; α(N)=0.0001103 *15* α(O)=2.72×10^{-5} *4*; α(P)=5.02×10^{-6} *7*; α(Q)=2.94×10^{-7} *4*
		718.6# *2*	100# *16*	147.45	4$^+$	[E1]	0.00727 *10*	α(K)=0.00589 *8*; α(L)=0.001045 *15*; α(M)=0.0002502 *35*; α(N)=6.77×10^{-5} *9* α(O)=1.671×10^{-5} *23*; α(P)=3.11×10^{-6} *4*; α(Q)=1.888×10^{-7} *26*
1074.3	12$^+$	300.8† *2*	100†	773.5	10$^+$	[E2]	0.2097 *30*	α(K)=0.0769 *11*; α(L)=0.0970 *14*; α(M)=0.0265 *4*; α(N)=0.00729 *10*; α(O)=0.001735 *25* α(P)=0.000291 *4*; α(Q)=4.39×10^{-6} *6*
1185.45	5$^-$	319.50# *11*	66# *10*	866.00	5$^-$	M1(+E2)	0.6 *4*	α(K)=0.4 *4*; α(L)=0.12 *4*; α(M)=0.030 *9*; α(N)=0.0081 *23*; α(O)=0.0020 *6*; α(P)=3.6×10^{-4} *13* α(Q)=1.8×10^{-5} *14* Mult.: from ^{236}Am ε decay (3.6 min).
		879.7# *2*	100# *14*	305.80	6$^+$	[E1]	0.00506 *7*	α(K)=0.00412 *6*; α(L)=0.000717 *10*; α(M)=0.0001712 *24*; α(N)=4.63×10^{-5} *6* α(O)=1.145×10^{-5} *16*; α(P)=2.144×10^{-6} *30*; α(Q)=1.334×10^{-7} *19* B(E1)(W.u.)=9.0×10^{-11} *26*
		1037.8# *2*	53# *8*	147.45	4$^+$	[E1]	0.00380 *5*	α(K)=0.00309 *4*; α(L)=0.000532 *7*; α(M)=0.0001268 *18*; α(N)=3.43×10^{-5} *5*; α(O)=8.50×10^{-6} *12* α(P)=1.596×10^{-6} *22*; α(Q)=1.010×10^{-7} *14* B(E1)(W.u.)=2.9×10^{-11} *9*
1311.51	(0$^-$)	613.2‡ *2*	100‡	698.31	1$^-$			
1340.82	(2$^-$)	582.8‡ *2*	100‡ *15*	758.02	3$^-$			
		642.5‡ *2*	53‡ *9*	698.31	1$^-$			
1413.6	14$^+$	339.3† *2*	100†	1074.3	12$^+$	[E2]	0.1459 *21*	α(K)=0.0620 *9*; α(L)=0.0614 *9*; α(M)=0.01670 *24*; α(N)=0.00458 *6*; α(O)=0.001094 *16* α(P)=0.0001850 *26*; α(Q)=3.31×10^{-6} *5*
1786.0	16$^+$	372.4† *3*	100†	1413.6	14$^+$	[E2]	0.1120 *16*	α(K)=0.0524 *7*; α(L)=0.0437 *6*; α(M)=0.01181 *17*; α(N)=0.00324 *5*; α(O)=0.000774 *11* α(P)=0.0001319 *19*; α(Q)=2.68×10^{-6} *4*
2188.0	18$^+$	402.0 *5*	100	1786.0	16$^+$			
2615.7	20$^+$	427.7@ *5*	100@	2188.0	18$^+$			
3063.7	22$^+$	448.0@ *5*	100@	2615.7	20$^+$			
3529.6	24$^+$	465.9@ *5*	100@	3063.7	22$^+$			

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Adopted Levels, Gammas (continued)

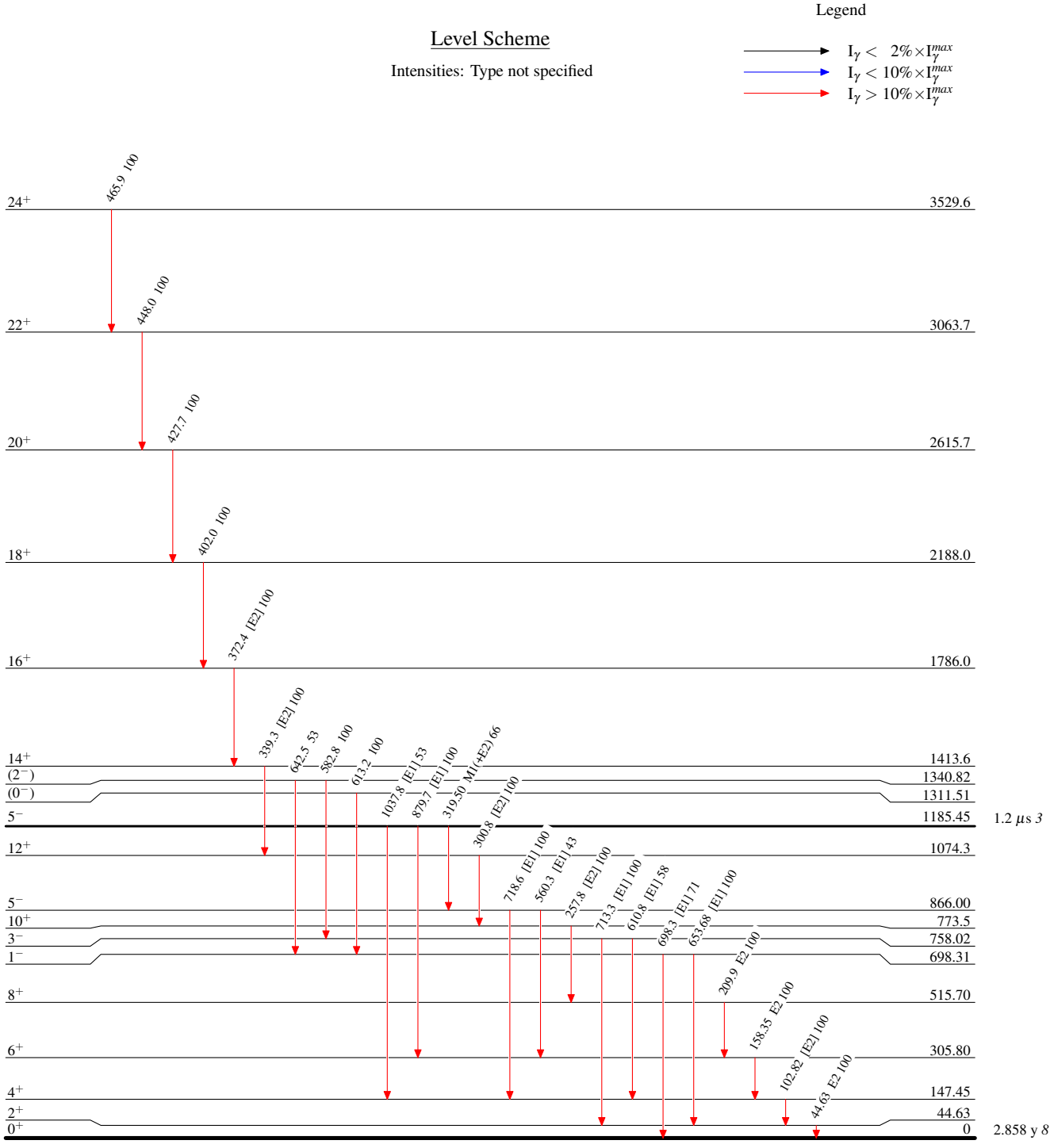
$\gamma(^{236}Pu)$ (continued)

† From $^{235}U(\alpha,3n\gamma)$.
‡ From ^{236}Am ε decay (2.9 min).
# From ^{236}Am ε decay (3.6 min).
@ From $^{237}Np(^{209}Bi,^{210}Pb\gamma)$.

Adopted Levels, Gammas

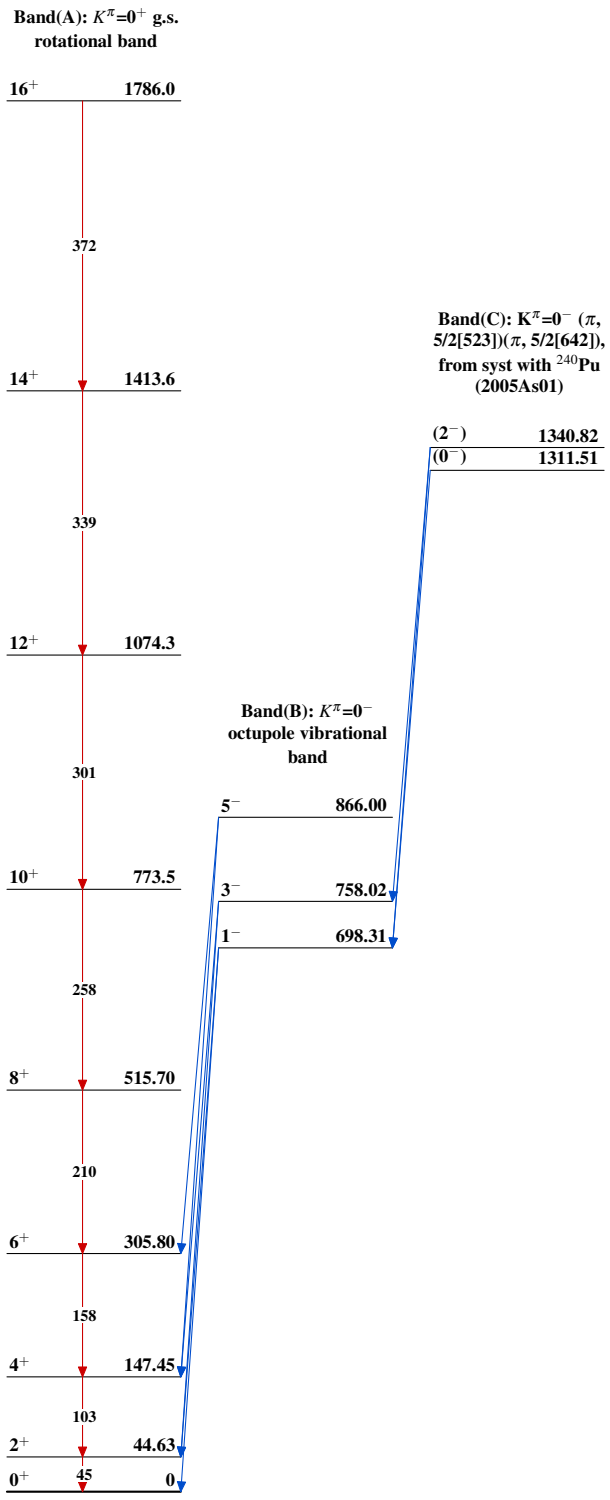
Level Scheme

Intensities: Type not specified



$^{236}_{94}Pu_{142}$

Adopted Levels, Gammas



$^{236}_{94}Pu_{142}$