Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

Q(β^-)=6884 *14*; S(n)=3837 *14*; S(p)=9105 *14*; Q(α)=−2335 *14* 2017Wa10
S(2n)=11644 *15*, S(2p)=20103 *14* (2017Wa10).

^{136}I Levels

Cross Reference (XREF) Flags

- A ^{136}Te β^- decay (17.63 s)
- B ^{137}Te β^-n decay
- C ^{252}Cf SF decay
- D ^{248}Cm SF decay

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0	(1$^-$)	83.4 s *4*	ABCD	%β^-=100 J$^\pi$: log *ft*=6.46 for β^- decay to 2$^+$ state, no decays to 3$^-$ states (1991Ma07), supported by Shell Model calculations (2009Co15,2010Co17). T$_{1/2}$: weighted average of 85.1 s *20* (γ(t), 1977We04), 83.4 s *4* (1972Wa21), 83 s *2* (γ(t), β(t), 1971Lu02), 83 s *3* (γ(t), 1970Ca25), and 82.8 s *15* (β(t), 1959Jo37).
86.73 *7*	(2$^-$,1$^-$,0$^-$)	0.4 ns *1*	ABCD	J$^\pi$: M1(+E2) 87.3γ to (1$^-$), population in ^{248}Cm SF decay favors J^π=2$^-$. T$_{1/2}$: from ce(t) in ^{252}Cf SF decay.
201 *26*	(6$^-$)	46.6 s *11*	D	%β^-=100 E(level): from β endpoint energies in 2007Fo02. Note that 2007Fo02, interpreted this as 7$^-$ isomer, however, observation of prompt, 42.6 keV transition from (7$^-$) level by 2006Ur02 indicates that the isomer is J^π=(6$^-$). Other: 640 *110* from 1985Wa04, based on $\beta\gamma$ coincidence data of 1980KeZQ. T$_{1/2}$: weighted average of 44.8 s *10* (γ(t), 1977We04), 48 s *2* (γ(t), β(t), 1971Lu02), 48 s *1* (γ(t), 1970Ca25). J$^\pi$: from log *ft*=6.4 for β decay to 6$^+$, weak or no β decay to 4$^+$, no observed IT decay, supported by shell model calculations (2006Ur02). configuration=$\pi g^2_{7/2} d_{5/2} \nu f_{7/2}$ (2006Ur02).
222.10 *7*			AB D	J$^\pi$: (3$^-$) proposed in ^{248}Cm SF decay based on assignment to γ-cascade, feeding from 0$^+$ parent in β^- decay suggests J=0,1,2.
243.6	(7$^-$)		CD	J$^\pi$: M1+E2 42.6γ to (6$^-$).
316.7			D	
333.97 *6*	(0$^-$,1)		AB	J$^\pi$: log *ft*=6.3 for β^- decay from 0$^+$ parent.
578.77 *3*	(0,1,2)		AB	J$^\pi$: 579γ to 1$^-$, 2078γ from 1$^+$.
630.53 *16*	(0$^-$,1)		AB	J$^\pi$: log *ft*=6.3 for β^- decay from 0$^+$ parent.
738.21 *19*	(0,1,2)		AB	J$^\pi$: 738γ to (1$^-$), 2497γ from 1$^+$.
1355.4 *26*	(9$^-$)		CD	J$^\pi$: (E2) 1112γ to (7$^-$).
1616.1 *26*	(11$^-$)	≈4 ns	CD	T$_{1/2}$: unplaced 261γ in ^{252}Cf SF decay observed with T$_{1/2}$=4 ns (1970Jo20). Other: 3.4 ns *6* also for unplaced 261γ (1974ClZX). J$^\pi$: (E2) 261γ to (9$^-$).
1859.4 *26*	(12$^-$)		CD	J$^\pi$: 243γ to (11$^-$).
2656.42 *22*	1$^+$		A	J$^\pi$: log *ft*=4.7 from 0$^+$ parent.
2685.1 *18*			D	J$^\pi$: (12$^-$) proposed by 1997Bh06 in ^{248}Cm SF decay based on shell model calculations.
3079.1			D	J$^\pi$: (12$^+$) proposed by 1997Bh06 in ^{248}Cm SF decay based on shell model calculations.
3137.1 *5*	1$^+$		A	J$^\pi$: log *ft*=5.3 from 0$^+$ parent.
3143.4			D	J$^\pi$: (13$^+$) proposed by 1997Bh06 in ^{248}Cm SF decay based on shell model calculations.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{136}I Levels (continued)

E(level)[†]	Jπ	XREF	Comments
3235.2 *3*	1^+	A	Jπ: log *ft*=4.5 from 0^+ parent.
3260		D	Jπ: (14^+) proposed by 1997Bh06 in ^{248}Cm SF decay based on shell model calculations.
3321		D	
4319		D	

[†] From least-squares fit to Eγ, by evaluator. For states built upon the 201-keV isomer, the uncertainty in the excitation energy is not propagated.

Adopted Levels, Gammas (continued)

$\gamma(^{136}I)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	δ	α @	Comments
86.73	(2⁻,1⁻,0⁻)	87.3 *2*	100	0	(1⁻)	M1(+E2)	<0.18	1.22 *6*	α(K)=0.960 *21*; α(L)=0.135 *11*; α(M)=0.0273 *24*; α(N)=0.0055 *5*; α(O)=0.00063 *4* B(E2)(W.u.)<120; B(M1)(W.u.)=0.036 *10* Mult.,δ: from α(exp)=1.22 *6* in ^{136}Te β^- decay. Other: α(K)exp=3.2 *8* in ^{248}Cm SF decay, however, theory gives α(K)=0.96 and 1.8 for M1 and E2 multipolarities. α: experimental value from ^{136}Te β^- decay.
222.10		135.385 *3*	100	86.73	(2⁻,1⁻,0⁻)				
243.6	(7⁻)	42.6#	100	201	(6⁻)	M1+E2		24 *16*	α(K)=9.1 *15*; α(L)=12 *11*; α(M)=2.6 *24*; α(N)=0.5 *5*; α(O)=0.04 *4* Mult.: from α(K)exp=7 *1* in ^{248}Cm SF decay.
316.7		94.5#	100	222.10					
333.97	(0⁻,1)	333.99 *6*	100	0	(1⁻)				
578.77	(0,1,2)	356.78 *6*	11	222.10					
		491.3 *3*	13	86.73	(2⁻,1⁻,0⁻)				
		578.75 *3*	100	0	(1⁻)				
630.53	(0⁻,1)	297.3 *5*	5	333.97	(0⁻,1)				
		543.2 *3*	21	86.73	(2⁻,1⁻,0⁻)				
		630.7 *2*	100	0	(1⁻)				
738.21	(0,1,2)	738.2 *2*	100	0	(1⁻)				
1355.4	(9⁻)	1111.8‡	100	243.6	(7⁻)	(E2)		1.22×10^{-3}	α(K)=0.001054 *15*; α(L)=0.0001322 *19*; α(M)=2.65×10^{-5} *4*; α(N)=5.36×10^{-6} *8*; α(O)=6.25×10^{-7} *9* Mult.: Q from $\gamma\gamma(\theta)$ in ^{252}Cf SF decay, assumed member of E2 cascade.
1616.1	(11⁻)	260.7‡	100	1355.4	(9⁻)	(E2)		0.0636	α(K)=0.0521 *8*; α(L)=0.00919 *13*; α(M)=0.00189 *3*; α(N)=0.000373 *6*; α(O)=3.94×10^{-5} *6* B(E2)(W.u.)≈2.7 Mult.: Q from $\gamma\gamma(\theta)$ in ^{252}Cf SF decay, assumed member of E2 cascade.
1859.4	(12⁻)	243.3‡	100	1616.1	(11⁻)				
2656.42	1⁺	2077.9 *3*	100	578.77	(0,1,2)				
		2569.4 *3*	69	86.73	(2⁻,1⁻,0⁻)				
		2656.0&*a* *6*	≈3&	0	(1⁻)				
2685.1		1069#	100	1616.1	(11⁻)				
3079.1		1463#	100	1616.1	(11⁻)				
3137.1	1⁺	2804.0 *6*	100	333.97	(0⁻,1)				
		3049.5 *6*	92	86.73	(2⁻,1⁻,0⁻)				
3143.4		1284	100	1859.4	(12⁻)				
3235.2	1⁺	2496.9 *5*	33	738.21	(0,1,2)				
		2604.8 *6*	8	630.53	(0⁻,1)				

$^{136}_{53}I_{83}$-3

Adopted Levels, Gammas (continued)

γ(^{136}I) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
3235.2	1^+	2656.0 &a *6*	≈4 &	578.77	(0,1,2)	3260		1402 #		1859.4	(12^-)
		3235.1 *4*	100	0	(1^-)			1644 #		1616.1	(11^-)
3260		117 #		3143.4		3321		242 #	100	3079.1	
		182 #		3079.1		4319		1058 #	100	3260	

† From ^{136}Te β^- decay, except where noted.
‡ From ^{252}Cf SF decay.
# From ^{248}Cm SF decay.
@ 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 intensity suitably divided.
a Placement of transition in the level scheme is uncertain.

$^{136}_{53}I_{83}$-4

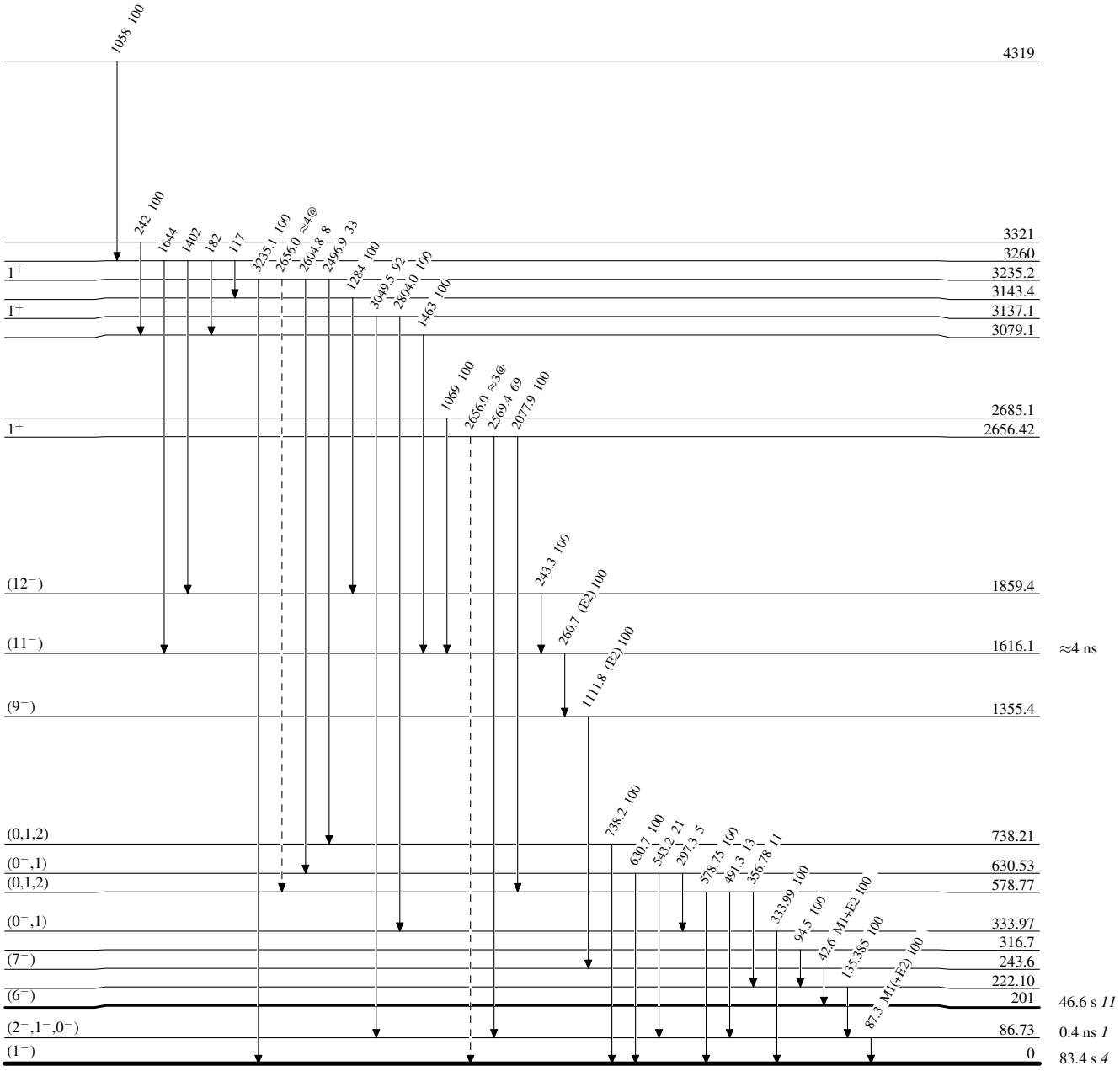
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

- - - - - - ► γ Decay (Uncertain)



$^{136}_{53}I_{83}$