Adopted Levels, Gammas

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

Q(β^-)=2548.2 *19*; S(n)=6828.4 *21*; S(p)=7215 *4*; Q(α)=−3060 *4* 2017Wa10
S(2n)=15590.2 *19*; S(2p)=16873 *5* (2017Wa10).
See ^{138}Ba(μ^-,2nγ) for possible unplaced gammas.

^{136}Cs Levels

Cross Reference (XREF) Flags

- A ^{136}Cs IT decay (17.5 s)
- B ^{136}Xe(^{3}He,t)
- C ^{138}Ba(μ^-,2nγ)
- D ^{238}U(^{12}C,Fγ),^{208}Pb(^{18}O,Fγ)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0.0	5+	13.01 d *5*	A	%β^-=100 Q=+0.213 *15* (1975Ac01,2016St14); μ=+3.711 *15* (1975Ac01) $T_{1/2}$: weighted average of 13.04 d *3* (2004Pa06, 819γ(t) and 1048γ(t), 3 $T_{1/2}$'s), 13.16 d *3* (1975Fl03 av of two β(t) and nine γ(t) measurements), 13.00 d *3* (1971Ba28, 6 to 8 $T_{1/2}$'s, 4$\pi\beta$(t)), 12.93 d *2* (1963Fr13, 18 $T_{1/2}$'s, average of 9 measurements). Other: 12.63 d *4* (1997Ka37, γ(t), 3 $T_{1/2}$'s, average of 6 measurements). μ: from optical level crossing (1975Ac01). Others: +3.71 *2* (1981Th06; atomic beam laser spectroscopy), +3.68 *4* (1971Da01, atomic beam). %β^-: %ε is negligible since ΔJ=5 and Q(ε)=80 *8*. Jπ: J from atomic beam magnetic resonance method (1981Th06,1976Fu06,1971Da01); π=+ from μ and J which are consistent only with indicated shell-model configurations. configuration: (πg7/2)(νd3/2)$^{-1}$. Q: re-evaluated value from 2016St14, based on Q=+0.225 *10* from 1975Ac01 using optical level crossing including polarization corrections. Other: 0.17 *6* (1981Th06, atomic beam high-resolution laser spectroscopy).
104.8 *3*	4+		A	E(level): from the energy difference of the 518γ and 413γ depopulating the 518-keV level. Jπ: M4 413γ from 8$^-$, 105γ to 5$^+$.
517.9 *1*	8−	17.5 s *2*	A D	%IT>0; %β^-=? Q=+0.74 *10* (1981Th06,2016St14) μ=+1.319 *7* (1981Th06) $T_{1/2}$: from 518γ(t) in ^{136}Cs IT decay. Others: 17 s *2* (1987BaYL), 19 s *2* (1975Ra03), 19 s *8* (1981Th06). %IT: γ-ray decay from the isomer has been observed, but the branching ratio is not known. Jπ: J from atomic-beam magnetic-resonance method (1981Th06). π=− from μ and J which are consistent only with indicated shell-model configurations. configuration: (πg7/2)(νh11/2)$^{-1}$. μ: from atomic beam high resolution laser spectroscopy (1981Th06). Q: re-evaluated value from 2016St14, based on Q=+0.74 *10* from 1981Th06 using atomic beam high resolution laser spectroscopy.
583.9 *5*	9−		D	Jπ: M1 66γ to 8$^-$.
590 *5*	1+[a]		B	
850 *5*	1+[a]		B	
1000 *5*	(2−)[a]		B	
1910 *5*	1+[a]		B	
1982.3# *6*	(11−)		D	

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Adopted Levels, Gammas (continued)

^{136}Cs Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
2010 *5*	1^{+a}	B	
2243.9[#] *6*	(12$^-$)	D	
2290 *5*	1^{+a}	B	
2360 *5*	1^{+a}	B	
2450 *5*	1^{+a}	B	
2500 *5*	1^{+a}	B	
2550 *5*	1^{+a}	B	
2600 *5*	1^{+a}	B	
2710 *5*	1^{+a}	B	
2810 *5*	1^{+a}	B	
2910 *5*	1^{+a}	B	
2927.6[@] *7*	(12$^-$)	D	
2973.7[#] *7*	(13$^-$)	D	
3257.8[@] *7*	(13$^-$)	D	
3380.1[#] *7*	(14$^-$)	D	
3420 *5*	1^{+a}	B	
3486.8[@] *7*	(14$^-$)	D	
3520 *5*	1^{+a}	B	
3562.5[&] *7*	(13$^+$)	D	
3684.0[&] *7*	(14$^+$)	D	
3929.1[&] *8*	(15$^+$)	D	
4086.7[@] *7*	(15$^-$)	D	
4359.2[#] *9*	(16$^-$)	D	
4396.1[@] *8*	(16$^-$)	D	
4645.8[&] *9*		D	
13380	0$^+$	B	E(level),J$^{\pi}$: IAS of 0$^+$ g.s. ^{136}Xe parent state (2011Pu06).

[†] From a least-squares fit to Eγ for level connected by γ-rays, except where noted. Levels with $\Delta E > 1$ keV are from ^{136}Xe(^{3}He,t).

[‡] From ^{238}U(^{12}C,Fγ),^{208}Pb(^{18}O,Fγ) based on the assumptions that 1) spin values increase with excitation energy along the yrast line and 2) most of the transitions are dipole in character as well as comparisons with shell model calculations, except where noted.

[#] Seq.(A): Sequence based on (11$^-$). Configuration=$\pi d_{5/2}\otimes\pi g^4_{7/2}\otimes\nu h^{-1}_{11/2}$.

[@] Seq.(B): Sequence based on (12$^-$). Configuration=$\pi g^3_{7/2}\otimes\pi d^2_{5/2}\otimes\nu h^{-1}_{11/2}$.

[&] Seq.(C): Sequence based on (13$^+$). Possible configuration=$\pi h_{11/2}\otimes\pi g^2_{7/2}\otimes\nu h^{-1}_{11/2}$.

[a] From shapes of measured $\sigma(\theta)$ in (^{3}He,t) and comparison with DWBA calculations.

γ(^{136}Cs)

E$_i$(level)	J$_i^{\pi}$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$_f^{\pi}$	Mult.[‡]	Comments
104.8	4$^+$	104.8	100	0.0	5$^+$	(E2)	E$_\gamma$,I$_\gamma$: from ^{136}Cs IT Decay.
517.9	8$^-$	413.1 *3*	0.072	104.8	4$^+$	M4	E$_\gamma$,I$_\gamma$: from ^{136}Cs IT Decay.
		517.9 *1*	100	0.0	5$^+$	E3	E$_\gamma$,I$_\gamma$: from ^{136}Cs IT Decay.
583.9	9$^-$	66.0 *5*	100	517.9	8$^-$	M1	Mult.: from α(exp) in ^{238}U(^{12}C,Fγ),^{208}Pb(^{18}O,Fγ).
1982.3	(11$^-$)	1398.4 *3*	100	583.9	9$^-$		
2243.9	(12$^-$)	261.6 *2*	100	1982.3	(11$^-$)		
2927.6	(12$^-$)	945.3 *4*	100	1982.3	(11$^-$)		

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Adopted Levels, Gammas (continued)

$\gamma(^{136}Cs)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	Comments
2973.7	(13^-)	729.8 *3*	100	2243.9	(12^-)		
3257.8	(13^-)	330.2 *3*	100 *25*	2927.6	(12^-)		
		1013.7 *5*	100 *40*	2243.9	(12^-)		
3380.1	(14^-)	406.4 *3*	100	2973.7	(13^-)		
3486.8	(14^-)	229.0 *4*	100 *25*	3257.8	(13^-)		
		513.2 *4*	100 *30*	2973.7	(13^-)		
3562.5	(13^+)	635.0 *5*	50 *25*	2927.6	(12^-)		
		1318.5 *5*	100 *40*	2243.9	(12^-)		
3684.0	(14^+)	121.4 *5*	17 *4*	3562.5	(13^+)	M1	Mult.: from α(exp) in $^{238}U(^{12}C,F\gamma)$,$^{208}Pb(^{18}O,F\gamma)$.
		710.4 *3*	100 *30*	2973.7	(13^-)		
3929.1	(15^+)	245.1 *3*	100	3684.0	(14^+)		
4086.7	(15^-)	599.8 *5*	100 *30*	3486.8	(14^-)		
		706.5 *5*	11 *6*	3380.1	(14^-)		
		1113.2 *5*	56 *22*	2973.7	(13^-)		
4359.2	(16^-)	979.1 *5*	100	3380.1	(14^-)		
4396.1	(16^-)	309.4 *4*	100 *50*	4086.7	(15^-)		
		1015.9 *5*	50 *25*	3380.1	(14^-)		
4645.8		716.7 *4*	100	3929.1	(15^+)		

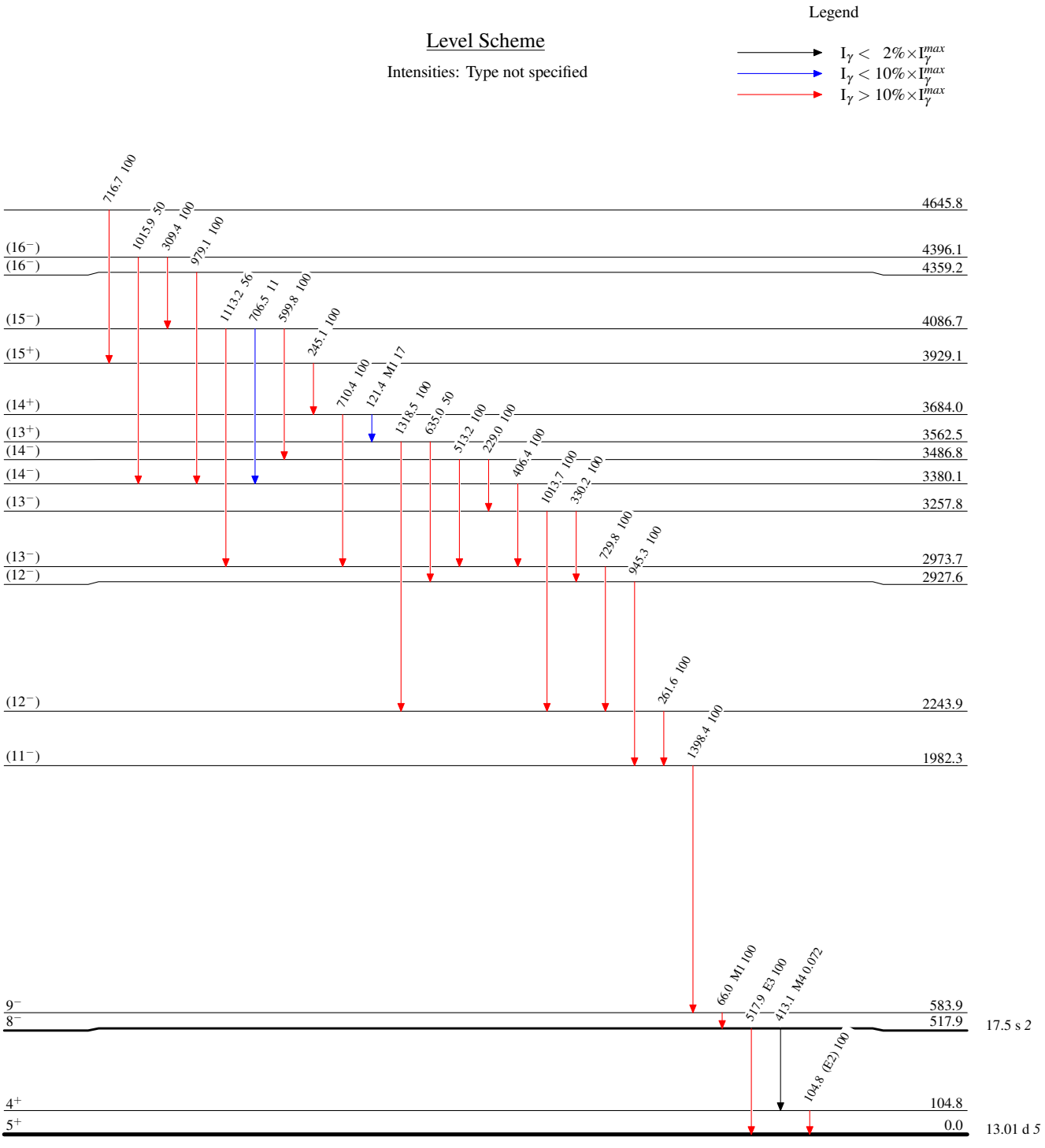
† From $^{238}U(^{12}C,F\gamma)$,$^{208}Pb(^{18}O,F\gamma)$, except where noted.

‡ From experimental conversion coefficients and subshell ratios in ^{136}Cs IT Decay, except where noted.

Adopted Levels, Gammas

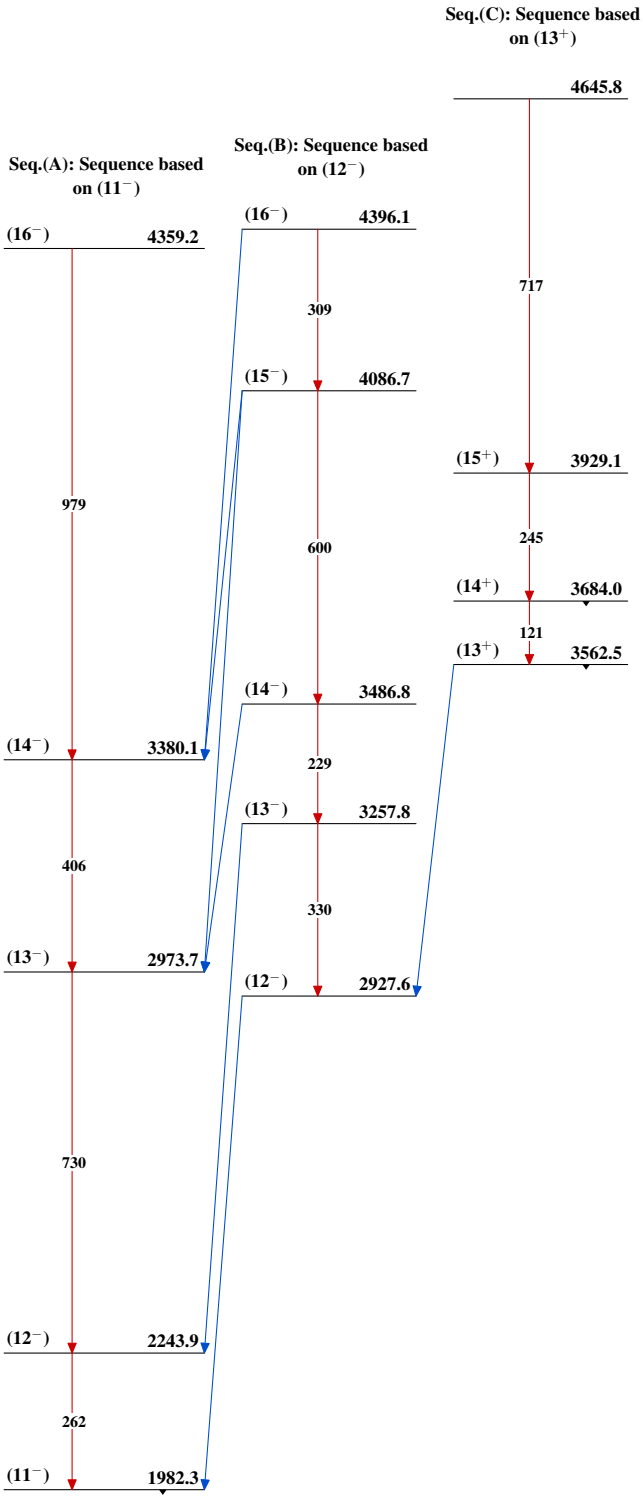
Level Scheme

Intensities: Type not specified



$^{136}_{55}Cs_{81}$

Adopted Levels, Gammas



$^{136}_{55}Cs_{81}$