^{133}Xe β^- decay (5.2475 d) 1961Er04,1968Al16,1992Ma05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov and A. Rodionov, F. G. Kondev	NDS 112, 855 (2011)	31-Oct-2010

Parent: ^{133}Xe: E=0.0; $J^\pi=3/2^+$; $T_{1/2}$=5.2475 d *5*; Q(β^-)=427.4 *24*; %β^- decay=99.9896 *5*

1992Ma05: ^{133}Xe gas source; measured Eγ, Iγ, $T_{1/2}$; HPGe detector.

1961Er04: ^{133}Xe source was implanted in Al-backing with isotope separator; measured Eγ. Iγ, Ece, Ice, α(exp), $T_{1/2}$, Q(β^-). Separator, NaI(Tl) detector, double-focusing magnetic spectrometer.

1968Al16: ^{133}Xe gas source; measured Eγ, Iγ, $T_{1/2}$; Ge(Li) detector.

Others: 1952Be55, 1953Gr07, 1958Al98, 1958Pl55, 1959Jh17, 1960Bo02, 1960Mu03, 1962Th12, 1964Si21, 1965Ge04, 1969Fr04, 1970Av01, 1980VyZZ.

^{133}Cs Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	$7/2^+$	stable	
80.9979 *8*	$5/2^+$	6.283 ns *14*	$T_{1/2}$: from Adopted Levels. Measured values in ^{133}Xe β^- decay (5.2475 d) are 6.0 ns *4* (1953Gr07), 6.3 ns *2* (1958Al98), 6.25 ns *10* (1962Th12), 6.3 ns *3* (1965Ge04).
160.6121 *10*	$5/2^+$		
383.8491 *8*	$3/2^+$		

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

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(43.6 *24*)	383.8491	0.0087 *10*	6.86 *9*	av Eβ=11.10 *63*
(266.8 *24*)	160.6121	1.4 *6*	7.10 *19*	av Eβ=75.16 *75*
346 *3*	80.9979	98.5 *13*	5.619 *12*	av Eβ=100.62 *79*
				E(decay): from 1961Er04. Other: 347 *4* (1952Be55).

† From intensity balances.
‡ For absolute intensity per 100 decays, multiply by 0.999896 *5*.

γ(^{133}Cs)

Iγ normalization: From Σ(I(γ+ce))=100 to g.s. and by assuming that there is no direct β^- feeding to the ^{133}Cs ground state.
I(Kα_2 x ray/Kα_1 x ray)=0.5310 *15*, I(Kβ_1 x ray/Kα_1 x ray)=0.1767 *21*, I(Kβ x ray/Kα x ray)=0.2021 *10* (2007Ya02).

E$_\gamma$‡	I$_\gamma$#@	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.‡	δ‡	α†	Comments
79.6142 *12*	1.2 *5*	160.6121	$5/2^+$	80.9979	$5/2^+$	M1+E2	0.124 *15*	1.77 *3*	α(K)=1.495 *22*; α(L)=0.217 *6*; α(M)=0.0447 *13*; α(N+..)=0.0107 *3* α(N)=0.00940 *25*; α(O)=0.00128 *3*; α(P)=5.84×10^{-5} *9* α(L1)=0.1816 *25*; α(L2)=0.0220 *21*; α(L3)=0.013 *3* Mult.: K:L1:L2:L3=0.57 *7*:0.060 *8*:≤0.009:≤0.009 (1969Fr04). δ: Others:<0.16 (1969Fr04); 0.14 *3*

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$\gamma(^{133}Cs)$ (continued)

E_γ[‡]	I_γ[#@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[†]	Comments
									calculated by evaluators with BrIccMixing program from known shell intensities. I_γ: average of 0.8 *1* (1961Er04) and 1.6 *7* (1968Al16).
80.9979 *11*	100	80.9979	$5/2^+$	0.0	$7/2^+$	M1+E2	0.158 *5*	1.703	α(K)=1.431 *20*; α(L)=0.216 *4*; α(M)=0.0447 *8*; α(N+..)=0.01071 *18* α(N)=0.00939 *16*; α(O)=0.001271 *20*; α(P)=5.56×10^{-5} *8* α(L1)=0.1730 *24*; α(L2)=0.0253 *9*; α(L3)=0.0181 *10* Mult.: K:L1:L2:L3:M1:M2:M3:N1:N2+= 100:12.9 *4*:1.94 *6*:1.44 *5*:3.0 *2*:0.56 *7*:0.37 *5*:0.64 *5*:0.08 *3* averages of 1961Br09, 1961Er04, 1964Si21 and 1969Fr04 (evaluated by 1982KhZW). α(K)=1.43 4, weighted average of α(K)exp=1.39 *6* (1961Er04) and 1.46 *5* (1970Av01) (absolute K x ray and γ-ray counting). δ: Others: 0.161 *9* calculated by evaluators using the BrIccMixing program from shell intensities cited.
160.6120 *16*	0.2889 *23*	160.6121	$5/2^+$	0.0	$7/2^+$	M1+E2	0.96 *5*	0.294 *6*	α(K)=0.234 *4*; α(L)=0.0471 *13*; α(M)=0.0099 *3*; α(N+..)=0.00232 *7* α(N)=0.00205 *6*; α(O)=0.000261 *7*; α(P)=8.08×10^{-6} *12* I_γ: from branching ratio in adopted gammas. Others: 0.242 *25* (1992Ma05), 0.109 *10* (1961Er04) and 0.174 *9* (1968Al16). Mult.: ce(K)=0.025 *6* (1980VyZZ).
223.2368 *13*	0.00037 *5*	383.8491	$3/2^+$	160.6121	$5/2^+$	M1+E2	−0.114 *14*	0.0975	α(K)=0.0836 *12*; α(L)=0.01103 *16*; α(M)=0.00226 *4*; α(N+..)=0.000547 *8* α(N)=0.000477 *7*; α(O)=6.64×10^{-5} *10*; α(P)=3.26×10^{-6} *5* I_γ: from branching ratio in adopted gammas. Others:

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^{133}Xe β^- decay (5.2475 d) 1961Er04,1968Al16,1992Ma05 (continued)

$\gamma(^{133}Cs)$ (continued)

E_γ[‡]	I_γ[#@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[†]	Comments
									0.0004 *4* (1961Er04), 0.00065 *61* (1968Al16) and 0.00044 *18* (1992Ma05).
302.8508 *5*	0.0150 *22*	383.8491	3/2$^+$	80.9979	5/2$^+$	M1+E2	+0.022 *20*	0.0434	α(K)=0.0373 *6*; α(L)=0.00484 *7*; α(M)=0.000988 *14*; α(N+..)=0.000240 *4* α(N)=0.000209 *3*; α(O)=2.92×10^{-5} *4*; α(P)=1.453×10^{-6} *21* I_γ: unweighted average of 0.0123 *12* (1992Ma05), 0.0135 *4* (1961Er04) and 0.0193 *7* (1968Al16).
383.8485 *12*	0.0073 *10*	383.8491	3/2$^+$	0.0	7/2$^+$	E2		0.0202	α(K)=0.01684 *24*; α(L)=0.00270 *4*; α(M)=0.000560 *8*; α(N+..)=0.0001326 *19* α(N)=0.0001166 *17*; α(O)=1.541×10^{-5} *22*; α(P)=5.90×10^{-7} *9* I_γ: from branching ratio in adopted gammas. Others: 0.00090 *4* (1992Ma05), 0.00618 *19* (1961Er04) and 0.0062 *9* (1961Er04).

† Additional information 1.

‡ From adopted gammas. Spectroscopic information on conversion coefficients and subshell ratios from ^{133}Xe β^- decay data is presented. The penetration effect in the conversion was investigated in 1970To01, 1975Ra17, 1979Th02, but the results were contradictory.

Normalized to Iγ(80.9974)=100 by the evaluators.

@ For absolute intensity per 100 decays, multiply by 0.369 *3*.

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Decay Scheme

Intensities: Relative I_γ