^{251}Es ε decay 1970Ah01,2005Ah09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. Morse	NDS 189,111 (2023)	23-Sep-2022

Parent: ^{251}Es: E=0; J$^\pi$=3/2$^-$; $T_{1/2}$=33 h *1*; Q(ε)=377 *6*; %ε decay=99.5 *1*
^{251}Es-Q(ε): From 2021Wa16.
Production: ^{249}Bk(α,xn) and ^{249}Bk(^{3}He,xn), ion chem. Measured: Eγ, Iγ, $\gamma\gamma$, (Ge(Li), NaI(Tl)) (1970Ah01).
2005Ah09: decay product of ^{251}Fm. Measured ce, Si(Li), FWHM=1 at 100 keV; γ, Ge(Li).

^{251}Cf Levels

E(level)†	J$^\pi$‡	Comments
0	1/2$^+$	configuration=ν1/2$^+$[620] (1970Ah01)
24.9	3/2$^+$	
48.0	5/2$^+$	
106.3	7/2$^+$	
177.6	3/2$^+$	configuration=ν3/2$^+$[622] (1970Ah01)
211.5	5/2$^+$	

† From 1970Ah01.
‡ From Adopted Levels.

ε radiations

1970Ah01 report that from Iγ, I(K x ray) and (γ)(K x ray) coincidences, ≈65% of ε feeds the g.s. band. This I(ε), however, does not produce agreement between the measured and calculated I(K x ray). From the measured I(K x ray) the intensity of the ε to the g.s. band is ≈80%.

Decays depopulating the levels in the ground-state band were not observed. The intensity and log *ft* values associated with the ground state given here should be understood to apply to the levels of the ground-state band as a group.

E(decay)	E(level)	Iε†‡	Log *ft*	Comments
(166 *6*)	211.5	≈1.00	≈6.9	εK=0.12 *4*; εL=0.600 *23*; εM+=0.276 *14*
(199 *6*)	177.6	≈19	≈5.9	εK=0.30 *3*; εL=0.486 *18*; εM+=0.213 *10*
(377 *6*)	0	≈80	≈6.1	εK=0.610 *4*; εL=0.279 *3*; εM+=0.1104 *13*

† Deduced from intensity balance in the level scheme.
‡ Absolute intensity per 100 decays.

γ(^{251}Cf)

Iγ normalization: %Iγ from 2005Ah09.
I(Cf K x ray)=64% *5* (2005Ah09), K x ray/177.6γ=18 *2* from (K x ray)(K x ray,177.6γ) (1970Ah01).

E$_\gamma$	I$_\gamma$#	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	α‡	Comments
(23.0)		48.0	5/2$^+$	24.9	3/2$^+$			
(24.8)		24.9	3/2$^+$	0	1/2$^+$			
(47.8)		48.0	5/2$^+$	0	1/2$^+$			
71.5	≈0.009†	177.6	3/2$^+$	106.3	7/2$^+$	E2	107.5	ce(L2)≈0.25 (2005Ah09); ce(L3)≈0.20 (2005Ah09) ce(M)≈0.20 (2005Ah09); ce(N)≈0.06 (2005Ah09) α(L)=77.4 *11*; α(M)=22.1 *3*; α(N)=6.21 *9*; α(O)=1.535 *22*; α(P)=0.243 *4*; α(Q)=0.000714 *10*

Continued on next page (footnotes at end of table)

^{251}Es ε decay 1970Ah01,2005Ah09 (continued)

$\gamma(^{251}Cf)$ (continued)

E_γ	I_γ[#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[‡]	Comments
81.2	≈0.005[†]	106.3	7/2+	24.9	3/2+	E2		58.9	ce(L1)+ce(L2)≈0.13 (2005Ah09); ce(M)≈0.06 (2005Ah09) α(L)=42.4 *6*; α(M)=12.10 *17*; α(N)=3.40 *5*; α(O)=0.842 *12*; α(P)=0.1337 *19*; α(Q)=0.000426 *6*
129.8	0.84[†] *7*	177.6	3/2+	48.0	5/2+	M1		4.01	ce(L1)+ce(L2)=2.5 *2* (2005Ah09); ce(M)=0.62 *5* (2005Ah09) α(L)=3.01 *5*; α(M)=0.739 *11*; α(N)=0.205 *3*; α(O)=0.0532 *8*; α(P)=0.01027 *15* α(Q)=0.000605 *9* E_γ: from electron line (2005Ah09).
152.8	0.530 *45*	177.6	3/2+	24.9	3/2+	M1		11.36	α(L1)exp+α(L2)exp=1.90 *23* (2005Ah09); α(M)exp=0.45 *5* (2005Ah09) ce(L1)+ce(L2)=1.00 *8* (2005Ah09); ce(M)=0.24 *2* (2005Ah09) α(K)=8.84 *13*; α(L)=1.88 *3*; α(M)=0.463 *7*; α(N)=0.1283 *18*; α(O)=0.0333 *5*; α(P)=0.00643 *9* α(Q)=0.000378 *6*
163.8	0.056 *7*	211.5	5/2+	48.0	5/2+	[M1]		9.33	α(L1)exp+α(L2)exp=1.6 *3* (2005Ah09); ce(L1)+ce(L2)=0.09 *2* (2005Ah09) α(K)=7.27 *11*; α(L)=1.544 *22*; α(M)=0.380 *6*; α(N)=0.1052 *15*; α(O)=0.0273 *4* α(P)=0.00527 *8*; α(Q)=0.000310 *5*
177.6	1.30 *11*	177.6	3/2+	0	1/2+	M1+E2	0.44 *8*	6.69	α(K)exp=5.1 *6* (2005Ah09); α(L1)exp+α(L2)exp=1.17 *14* (2005Ah09) α(L3)exp=0.06 *1* (2005Ah09); α(M)exp=0.30 *4* (2005Ah09) α(N)exp=0.120 *14* (2005Ah09); ce(K)=6.60 *55* (2005Ah09) ce(L1)+ce(L2)=1.52 *13* (2005Ah09); ce(L3)=0.078 *15* (2005Ah09) ce(M)=0.390 *33* (2005Ah09); ce(N)=0.160 *14* (2005Ah09) α(K)=5.04 *7*; α(L)=1.223 *18*; α(M)=0.307 *5*; α(N)=0.0852 *12*; α(O)=0.0220 *3* α(P)=0.00415 *6*; α(Q)=0.000217 *3* δ: Calculated from measured conversion coefficients using BrIccMixing v2.3d.

† From ce(M) (2005Ah09) and α(M) (Theory).
‡ Additional information 1.
\# For absolute intensity per 100 decays, multiply by 0.995 *1*.

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