^{257}Fm α decay 1967As02,1982Ah01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 114, 1041 (2013)	1-Mar-2012

Parent: ^{257}Fm: E=0.0; $J^{\pi}=(9/2^+)$; $T_{1/2}$=100.5 d *2*; Q(α)=6863.5 *14*; %α decay=99.790 *4*

^{253}Cf Levels

E(level)†	J^{π}‡	Comments
0.0	$(7/2^+)$	
61.61 *8*	$(9/2^+)$	
136.62 *9*	$(11/2^+)$	
241.01 *8*	$(9/2^+)$	
321.21 *22*	$(11/2^+)$	
417 *5*	$(13/2^+)$	E(level): calculated from Eα.

† From least-squares fit to Eγ, unless otherwise noted.
‡ From Adopted Levels.

α radiations

Eα†	E(level)	Iα†@	HF‡	Comments
6346 *5*	417	0.3 *1*	68 *23*	
6441 *3*	321.21	2.0 *2*	29 *3*	
6519.5# *14*	241.01	93.8# *7*	1.487 *15*	
(6622)	136.62	<1.2	>347	
6695 *3*	61.61	3.4 *2*	267 *16*	Iα: weighted average of 3.2 *3* (1967As02) and 3.5 *3* (1982Ah01). HF: see 1982Ah01 for calculation of Hf(6695α) including Coriolis interaction between 7/2[613] and 9/2[615] bands.
6752# *3*	0.0	0.58# *6*	2.92×10^3 *31*	

† From 1982Ah01, unless otherwise noted.
‡ $r_0(^{253}Cf)$=1.5091.
# Recommended value from 1991Ry01 based on adjusted measurements of 1967As02 and 1982Ah01.
@ For absolute intensity per 100 decays, multiply by 0.99790 *4*.

^{257}Fm α decay 1967As02,1982Ah01 (continued)

γ(^{253}Cf)

Iγ normalization: From decay scheme.
K x ray(Cf)=58% 4 (from γ spectrum, 1982Ah01); K x ray(Cf)=53% 3 (from measured I(ce(K)), 1982Ah01).

E_γ[‡]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	$I_{(\gamma+ce)}$[&]	Comments
61.6 *1*	1.45 *8*	61.61	(9/2$^+$)	0.0	(7/2$^+$)	M1+E2	0.27 *2*	47.4 *19*		α(L)=35.1 *14*; α(M)=9.1 *4*; α(N+..)=3.29 *15* α(N)=2.52 *12*; α(O)=0.64 *3*; α(P)=0.117 *5*; α(Q)=0.00503 *9* Mult.,δ: α(L12)exp=31 *3*, L12/L3=6.7 *9*, L:M:N+=51 *7*: 15.0 *15*: 6.7 *7* (1982Ah01). Theory α(L12)=32.8 *9*, L12/L3=7.2 *10*, L:M:N+=51: 13.1 *5*: 5.1 *2*.
75.0 *1*	0.200 *17*	136.62	(11/2$^+$)	61.61	(9/2$^+$)	(M1)		19.7		α(L)=14.72 *22*; α(M)=3.62 *6*; α(N+..)=1.318 *20* α(N)=1.004 *15*; α(O)=0.261 *4*; α(P)=0.0504 *8*; α(Q)=0.00298 *5* Mult.: α(L12)exp=16.5 *29* (1982Ah01). Theory: α(L12)=15.8.
80.2 *2*	0.085 *9*	321.21	(11/2$^+$)	241.01	(9/2$^+$)	(M1+E2)		39 *24*		α(L)=29 *17*; α(M)=8 *5*; α(N+..)=2.9 *18* α(N)=2.2 *14*; α(O)=0.6 *4*; α(P)=0.09 *5*; α(Q)=0.0014 *10* Mult.: intensity balance at the 321.2 level suggests M1+E2 multipolarity.
(96 *5*)		417	(13/2$^+$)	321.21	(11/2$^+$)	[M1,E2]		18 *10*	≤0.3	ce(L)/(γ+ce)=0.7 *3*; ce(M)/(γ+ce)=0.19 *13*; ce(N+)/(γ+ce)=0.07 *5* ce(N)/(γ+ce)=0.05 *4*; ce(O)/(γ+ce)=0.013 *10*; ce(P)/(γ+ce)=0.0022 *16*; ce(Q)/(γ+ce)=4.E−5 *4* $I_{(\gamma+ce)}$: from intensity balance.
104.4 *1*	0.62 *5*	241.01	(9/2$^+$)	136.62	(11/2$^+$)	(M1)		7.52		α(L)=5.63 *8*; α(M)=1.386 *20*; α(N+..)=0.504 *8* α(N)=0.384 *6*; α(O)=0.0997 *15*; α(P)=0.0193 *3*; α(Q)=0.001136 *17* Mult.: α(L12)exp=5.3 *8* (1982Ah01). Theory: α(L12)=6.08.
136.7 *2*	0.06 *2*	136.62	(11/2$^+$)	0.0	(7/2$^+$)	[E2]		5.59		α(K)= 0.124; α(L)=3.91; α(M)=1.11; α(N+..)= 0.445
179.4 *1*	8.7 *7*	241.01	(9/2$^+$)	61.61	(9/2$^+$)	M1+E2	0.58 *13*	5.8 *5*		α(K)=4.2 *5*; α(L)=1.182 *17*; α(M)=0.301 *6*; α(N+..)=0.1095 *19* α(N)=0.0839 *15*; α(O)=0.0215 *4*; α(P)=0.00398 *7*; α(Q)=0.000185 *18* I_γ: absolute measurement in % of α decay. Mult.,δ: α(K)exp=4.6 *5*, K:L12:M:NO=40 *3*: 9.3 *9*: 2.6 *3*: 1.0 *3* (1982Ah01). Theory: α(K)=4.6 *5*, K:L12:M:NO=40: 11.0: 2.81: 1.09.
241.0 *1*	11.0 *6*	241.01	(9/2$^+$)	0.0	(7/2$^+$)	M1+E2	1.06 *13*	1.78 *17*		α(K)=1.22 *16*; α(L)=0.419 *14*; α(M)=0.109 *3*; α(N+..)=0.0396 *10* α(N)=0.0304 *8*; α(O)=0.00775 *21*; α(P)=0.00140 *5*; α(Q)=5.4×10^{-5} *7*

$^{253}_{98}Cf_{155}$-2

$\gamma(^{253}Cf)$ (continued)

E_γ [‡]	E_i(level)	Comments
		Mult.,δ: α(K)exp=1.31 *13*, K:L12:L3:M=14.4 *12*: 4.2 *4*: 0.53 *18*: 1.2 *2*. Theory: α(K)=1.31 *17*, K:L12:L3:M=14.4: 4.4 *3*: 0.49 *5*: 1.27 *3*.

† Additional information 1.
‡ From 1982Ah01; other: 1967As02.
# From I(ce) and Iγ of 1981Ah01; both intensities are given in % α-decay.
@ For absolute intensity per 100 decays, multiply by 0.93 *4*.
& Absolute intensity per 100 decays.

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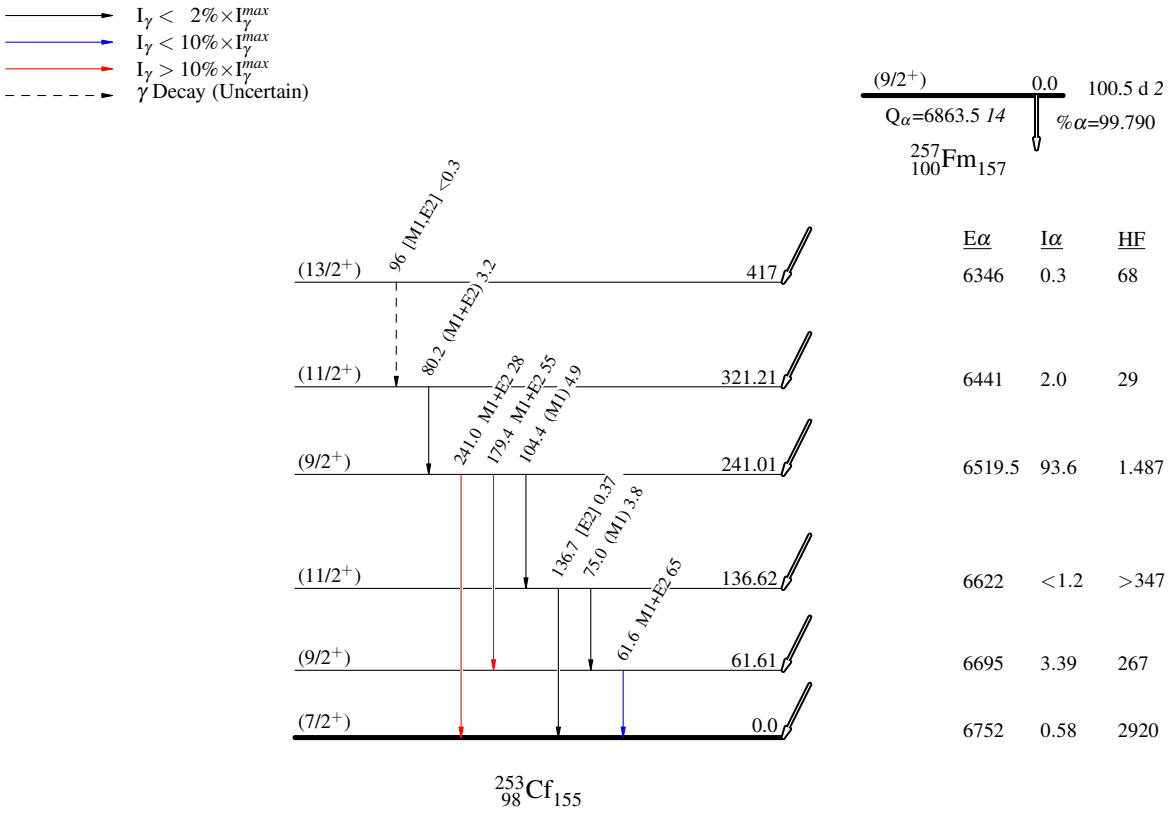
Decay Scheme

Intensities: Iα per 100 α decays of parent



Eα	Iα	HF
6346	0.3	68
6441	2.0	29
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6695	3.39	267
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