^{248}Cf α decay 1984Ah02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 146, 387 (2017)	31-Aug-2017

Parent: ^{248}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=333.5 d *28*; Q(α)=6361 *5*; %α decay=99.9971 *3*

^{248}Cf-$T_{1/2}$: From Adopted Levels of ^{248}Cf (2014Ma86).

^{248}Cf-Q(α): From 2017Wa10.

^{248}Cf-%α decay: From Adopted Levels of ^{248}Cf (2014Ma86).

1984Ah02: ^{248}Cf was produced from the ^{246}Cm(α,xn) reaction with E(α)=40 meV from the Argonne 152 cm cyclotron. The irradiation was followed by chemical separation and thin sources were prepared using the Argonne electromagnetic isotope separator. α particles were detected with a Au-Si surface barrier detector.

1973Hu01: Decay of ^{248}Cf source was measured for both alpha and spontaneous fission counting using an ionization chamber. Deduced half-life of ^{248}Cf. α decay were measured in coincidence with L X-rays in ^{244}Cm. Conversion coefficients were used for the 2^+ to 0^+ states to determine the L X-ray activities. Deduced α branching to the first excited state.

^{244}Cm Levels

E(level)‡	J^π‡
0.0†	0^+
42.957† *9*	2^+
142.340† *10*	4^+

† Band(A): $K=0^+$ gs band.
‡ Adopted values.

α radiations

Eα†	E(level)	Iα‡@	HF#	Comments
6118 *7*	142.340	0.4 *2*	40 *20*	
6217 *5*	42.957	19.6 *10*	2.52 *15*	Iα: 17 % *5* was deduced by 1973Hu01.
6258 *5*	0.0	80.0 *10*	1.00	

† From measurements in 1984Ah02.
‡ α intensity per 100 α decays measured by 1984Ah02.
# $r_0(^{244}Cm)$=1.4851 *24* (1998Ak04) is used in the calculation.
@ For absolute intensity per 100 decays, multiply by 0.999971 *3*.

$\gamma(^{244}Cm)$

E_γ†	I_γ‡@	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	α#	Comments
(42.965 *10*)	0.0190 *10*	42.957	2^+	0.0	0^+	E2	1050	α(L)=760 *11*; α(M)=214 *3* α(N)=59.5 *9*; α(O)=14.38 *21*; α(P)=2.35 *4*; α(Q)=0.00578 *9*
(99.383 *4*)	0.020 *10*	142.340	4^+	42.957	2^+	E2	19.3	α(L)=13.93 *20*; α(M)=3.94 *6* α(N)=1.095 *16*; α(O)=0.265 *4*; α(P)=0.0441 *7*; α(Q)=0.000180 *3*

† Gamma transitions were not observed in ^{248}Cf α decay. Energies and multipolarities are from the adopted gammas.
‡ Expected photon intensity per 100 α decays, calculated from total transition intensity and theoretical conversion coefficients.

Continued on next page (footnotes at end of table)

^{248}Cf α decay 1984Ah02 (continued)

$\gamma(^{244}Cm)$ (continued)

[#] Additional information 1.
[@] For absolute intensity per 100 decays, multiply by 0.999971 *3*.

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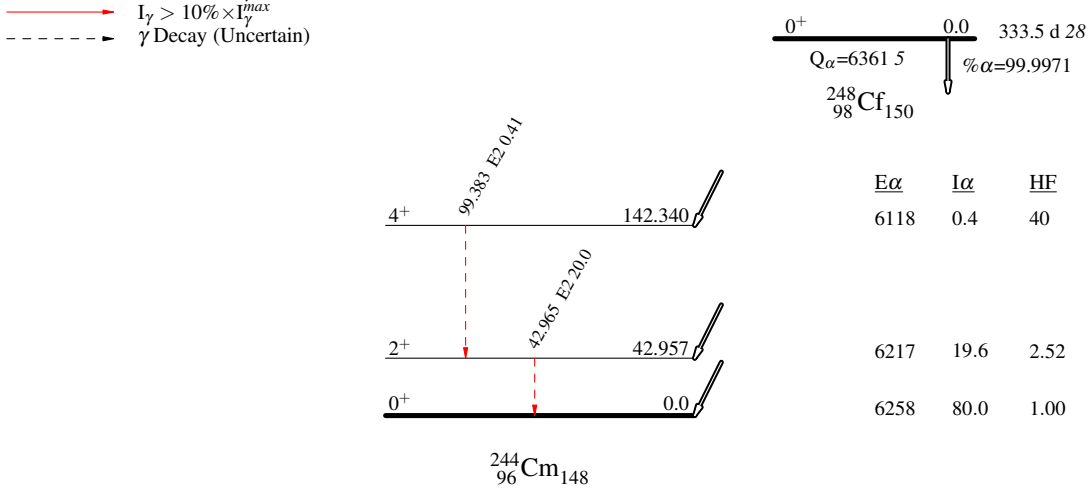
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 decays through this branch

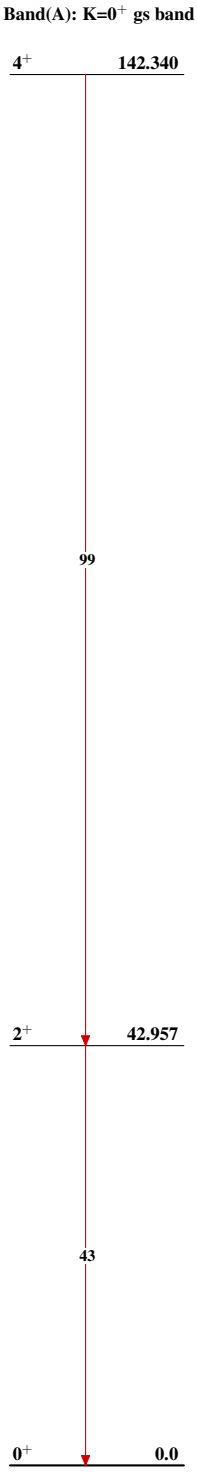
Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



Eα	Iα	HF
6118	0.4	40
6217	19.6	2.52
6258	80.0	1.00

^{248}Cf α decay 1984Ah02



$^{244}_{96}Cm_{148}$