^{249}Fm α decay   2011Lo06

	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	C. D. Nesaraja	NDS 189,1 (2023)	14-Feb-2023

Parent: ^{249}Fm: E=0.0; J$^{\pi}$=(7/2$^+$); T$_{1/2}$=2.6 min *7*; Q(α)=7709 *6*; %α decay=15.6 *10*

^{249}Fm-J$^{\pi}$,T$_{1/2}$: From the Adopted Levels in the ENDSF database for ^{249}Fm (2011Ab07).

^{249}Fm-Q(α): From 2021Wa16.

^{249}Fm-%α decay: %From the number of recorded α decays of ^{253}No (2012He09) Note the value α=33 *9* is given in the Adopted Levels for ^{249}Fm in 2011Ab07.

2012He09: ^{249}Fm was produced from the alpha decay of ^{253}No. Grand parent ^{253}No was populated in ^{207}Pb(^{48}Ca,2n). The experiment was performed at GSI, Darmstadt. Gammas were measured with Ge clover detectors. The position-sensitive (PIPS) detector surrounded in combination with silicon detectors were used to register the full energy α particles. About 85% of the α particles with full energy were registered using the setup. Measured Eα and compared the experimental results to GEANT simulations for energy distributions of the α particles.

2011Lo06: ^{249}Fm was produced from the alpha decay of ^{253}No. Grand parent ^{253}No was populated in ^{207}Pb(^{48}Ca,2n). The experiment was performed at the VASSILISSA recoil separator at Flerov Laboratory of Nuclear Reactions in Dubna using the GABRIELA detector setup. GABRIELA consisted of four micro-channel plates to detect secondary electrons, 48×48 strip double-sided silicon-strip detector to provide energy and time information of the implanted evaporation residues, 32-strip silicon detectors for the detection of internal conversion electrons and escape α particles and a ring of six Compton suppressed EUROGAM Phase-I Ge detectors placed around the focal plane and one unsuppressed Ge detector, placed in a collinear geometry with respect to the beam line to detect the γ-rays. Measured: Eα, Eγ, α-ce coin. Results were compared to GEANT4 simulation.

2004He28: ^{249}Fm was produced from the alpha decay of ^{253}No. Grand parent ^{253}No was populated in ^{207}Pb(^{48}Ca,2n). The experiment was performed at the UNILAC accelerator, GSI. Gammas were measured with Ge clover detectors and the alphas with the position-sensitive (PIPS) detector. Measured Eα. No γ-events in coincidence with α-particles were observed.

1985He06: ^{249}Fm was produced from the alpha decay of ^{253}No. Grand parent ^{253}No was populated in ^{208}Pb(^{50}Ti,X). The experiment was performed at the UNILAC accelerator, GSI. Alphas were measured with surface-barrier detectors.

Others: 2006Ni09, 1967Mi03, 1966Ak01.

^{245}Cf Levels

E(level)	J$^{\pi}$	T$_{1/2}$	Comments
0.0†	(1/2$^+$)	45.0 min *14*	
≈10†	(3/2$^+$)		E(level): From 2011Lo06. Other: ≈8 (2012He09).
57 *4*	(7/2$^+$)		Configuration=ν7/2[624] (2012He09).
			E(level): From 2011Lo06. Others: ≈ 55 keV (2012He09), 55 keV *10* (2004He28),

† Band(A): 1/2[631] rotational band.

α radiations

Eα	E(level)	Comments
7540 *5*	57	Eα: Effective α particle energy based on the GEANT4 simulations for the best fit with the measured alpha spectrum (2011Lo06). Others: ≈ 7529 keV (2012He09), ≈ 7520 keV (2004He28), 7527 keV *23* (1985He06), 7.54 MeV (1973Es01), 7.52 MeV *3* (1967Mi03), 7.53 MeV *2* (1966Ak01), 7.9 MeV *3* (1959Pe27). This alpha-particle group is expected to be a favored transition (2004He28). HF=1.7 was deduced by 2012He09 based on a single 7529α branch with theoretical half-life. 14, 917 (1983).
7581 *10*	0.0	Eα: From 2004He28.

^{249}**Fm** α **decay**   **2011Lo06 (continued)**

$\gamma(^{245}$Cf$)$

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	$\alpha^\dagger$	Comments
47 *3*	57	$(7/2^+)$	$\approx$10	$(3/2^+)$	[E2]	8.0×10^2 *30*	α(L)=5.8$\times10^2$ *22*; α(M)=1.6$\times10^2$ *6*
							α(N)=46 *17*; α(O)=11 *4*; α(P)=1.8 *7*; α(Q)=0.0042 *14*
							E_γ: From 2011Lo06. Transition is highly converted.

† Additional information 1.

^{249}**Fm** α **decay**   **2011Lo06**

Decay Scheme
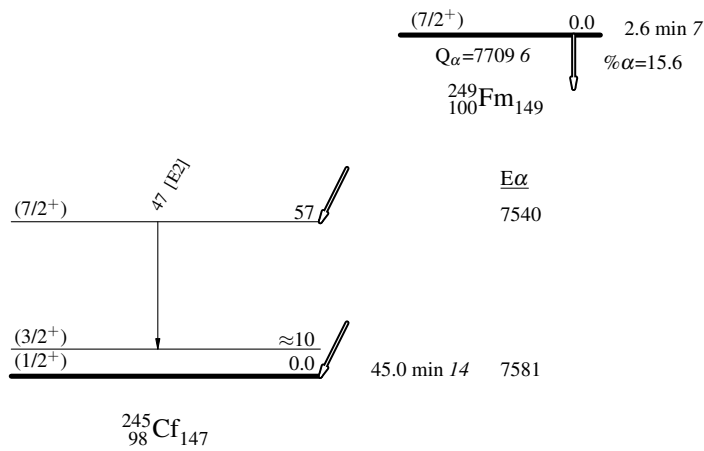
$^{245}_{98}$Cf$_{147}$

^{249}Fm α decay   2011Lo06

Band(A): 1/2[631]
rotational band

(3/2$^+$) $\approx$10

(1/2$^+$)   0.0

$^{245}_{98}$Cf$_{147}$