^{247}Cm α decay 1971Fi01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 121, 695 (2014)	30-Sep-2013

Parent: ^{247}Cm: E=0.0; $J^\pi=9/2^-$; $T_{1/2}=1.56\times10^7$ y *5*; Q(α)=5354 *3*; %α decay=100.0

^{247}Cm-ground state configuration 9/2[734].

1971Fi01: α decay from enriched ^{247}Cm measured with Au-Si surface barrier detector. γ- singles measured with a 4 cm^3 co-axial Ge(Li) detector. $\alpha\gamma$ coincidences measured by the Au-Si detector and γ's with a NaI(Tl) detector and Ge(Li) detector setup.

$\alpha\gamma$: coincidences reported by 1971Fi01 are summarized on decay scheme.

^{243}Pu Levels

E(level)[†]	J^π[‡]	Comments
0.0	$7/2^+$	
58.13 *22*	$9/2^+$	
124.8 *7*	$11/2^+$	
287.46 *19*	$5/2^+$	
333.21 *24*	$7/2^+$	
402.6 *3*	$9/2^-$	
455 *5*	$11/2^-$	E(level): From Eα and Qα(^{247}Cm).

† From Adopted Levels, except as noted.

‡ From Adopted Levels.

α radiations

Eα[†]	E(level)	Iα[‡@]	HF[#]
4820 *4*	455	4.7 *3*	11.2 *10*
4870 *4*	402.6	71.0 *10*	1.69 *8*
4943 *4*	333.21	1.6 *2*	228 *30*
4985 *4*	287.46	2.0 *2*	372 *40*
5147 *4*	124.8	1.2 *2*	7.2×10^3 *13*
5212 *4*	58.13	5.7 *5*	4.04×10^3 *39*
5267 *4*	0.0	13.8 *7*	3.83×10^3 *25*

† From 1971Fi01. The original energies have been increased by 2 keV, as recommended by 1991Ry01, because of a change in calibration energy.

‡ From 1971Fi01.

$r_0(^{243}Pu)$=1.4959 *9*, average of $r_0(^{242}Pu)$=1.4954 *10* and $r_0(^{244}Pu)$=1.4963 *8*, is used in calculations.

@ Absolute intensity per 100 decays.

$\gamma(^{243}Pu)$

Relative intensities of 402.4, 346.0, 278.0 γ's do not agree with those observed for analogous transitions in ^{245}Cm. As pointed out by 1971Fi01, they are not in good agreement with the Alaga rule.

x-rays(Pu):	1971Fi01		
Eγ	Iγ		
99.6 *3*	1.30 *15*	Kα_2	x ray
103.8 *3*	2.1 *2*	Kα_1	x ray
117.0 *3*	0.80 *13*	Kβ_1'	x ray
120.5 *4*	≈ 0.3	Kβ_2'	x ray

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	Comments
(58.1[@])		58.13	$9/2^+$	0.0	$7/2^+$			
(125[@])		124.8	$11/2^+$	0.0	$7/2^+$			
(229.3[@] *2*)	0.036 *10*	287.46	$5/2^+$	58.13	$9/2^+$	[E2]	0.518	α(K)=0.1223 *18*; α(L)=0.288 *5*; α(M)=0.0797 *12* α(N)=0.0219 *4*; α(O)=0.00519 *8*; α(P)=0.000856 *13*; α(Q)=8.66×10^{-6} *13* I_γ: obtained from I(287γ)/I(229γ) observed in (n,γ).
(275.1[@] *2*)		333.21	$7/2^+$	58.13	$9/2^+$			
278.0 *8*	3.4 *7*	402.6	$9/2^-$	124.8	$11/2^+$	[E1]	0.0488 *8*	α(K)=0.0385 *6*; α(L)=0.00777 *12*; α(M)=0.00188 *3* α(N)=0.000509 *8*; α(O)=0.0001242 *20*; α(P)=2.23×10^{-5} *4*; α(Q)=1.143×10^{-6} *18*
287.5 *7*	2.0 *3*	287.46	$5/2^+$	0.0	$7/2^+$	M1	1.343 *21*	α(K)=1.062 *17*; α(L)=0.211 *4*; α(M)=0.0513 *8* α(N)=0.01394 *22*; α(O)=0.00347 *6*; α(P)=0.000660 *11*; α(Q)=4.30×10^{-5} *7* Mult.: α(K)exp=1.1 *3* from K x-ray/Iγ observed in coincidence with α's feeding the 287- and 330-keV levels (1971Fi01). Eγ=287.4 *2* was measured in ^{242}Pu(n,γ).
(333.0[@] *10*)		333.21	$7/2^+$	0.0	$7/2^+$			
346.0 *8*	≈1.3	402.6	$9/2^-$	58.13	$9/2^+$	[E1]	0.0305	α(K)=0.0242 *4*; α(L)=0.00471 *7*; α(M)=0.001141 *17* α(N)=0.000308 *5*; α(O)=7.54×10^{-5} *12*; α(P)=1.370×10^{-5} *21*; α(Q)=7.35×10^{-7} *11*
402.4 *5*	72 *6*	402.6	$9/2^-$	0.0	$7/2^+$	E1	0.0222	α(K)=0.0178 *3*; α(L)=0.00338 *5*; α(M)=0.000817 *12* α(N)=0.000221 *4*; α(O)=5.42×10^{-5} *8*; α(P)=9.89×10^{-6} *14*; α(Q)=5.47×10^{-7} *8* Eγ=402.6 *3* was measured in ^{242}Pu(n,γ). Mult.: α(K)exp≤0.032 *12* from total K x ray and K x ray expected from 287γ. Experimental K-shell fluorescence yield of 0.972 *4* (1979Ah01) was used in calculations by evaluator.

† From 1971Fi01, unless noted otherwise.
‡ From 1971Fi01. Iγ's per 100 α decays.
# Multipolarities in square brackets are from level scheme.
@ Expected γ, not observed in ^{247}Cm α decay. Eγ's are from Adopted Gammas.
& Additional information 1.
a Absolute intensity per 100 decays.

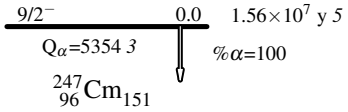
^{247}Cm α decay 1971Fi01

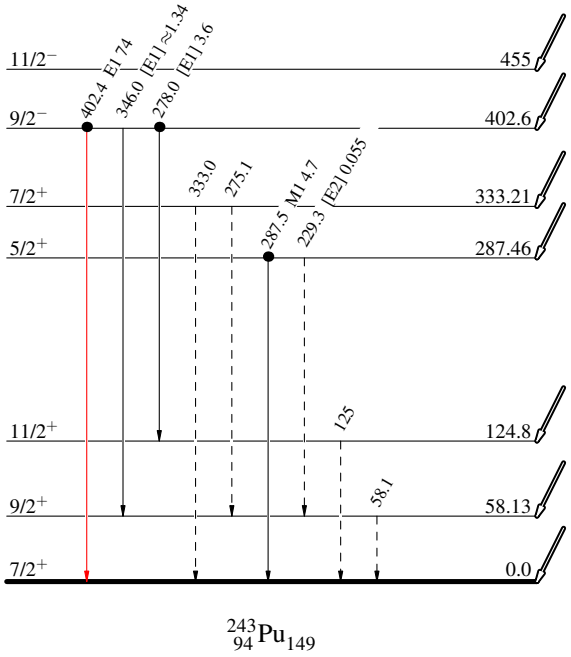
Decay Scheme

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)
- Coincidence

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





Eα	Iα	HF
4820	4.7	11.2
4870	71.0	1.69
4943	1.6	228
4985	2.0	372
5147	1.2	7200
5212	5.7	4040
5267	13.8	3830