^{246}Pu β^- decay 1971Mu05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 198,449 (2024)	31-Jul-2022

Parent: ^{246}Pu: E=0.0; $J^\pi=0^+$; $T_{1/2}$=10.84 d *2*; $Q(\beta^-)$=401 *syst*; %β^- decay=100
^{246}Pu-$Q(\beta^-)$: 401 *14* (2021Wa16)(syst,2021Wa16).
1971Mu05: ^{246}Pu was obtained from fused cavity debris underground explosion and subsequently was chemically separated. The decay was measured using several Ge(Li) detectors along with the Livermore Compton-suppression system. Measured Eγ, Iγ.
1956Ho23: ^{246}Pu was chemical separated. Measured γ, $\gamma\gamma$-coin, with two NaI(Tl) detectors and $\beta\gamma$- coin with one NaI(Tl) and a trans-stilbene crystal detector. Measured $T_{1/2}$ from decay curve. Deduced Eβ from Fermi plots.
Others: 1991Po17,1965St10,1956Sm85 (same group as 1956Ho23).

^{246}Am Levels

E(level)[†‡]	J^π[#]	$T_{1/2}$	Comments
0.0+x	(2$^-$)	25.0 min *2*	Additional information 1. $T_{1/2}$: From Adopted Levels.
16.21+x *5*	(0$^-$,1$^-$,2$^-$)		
43.806+x *15*	(1$^+$)	4.3 ns *3*	Additional information 2. $T_{1/2}$: From $\gamma\gamma$(t) (1965St10). This value is given in the Adopted Levels.
74.331+x *27*			Additional information 3.
223.742+x *17*	(1$^+$)		
232.761+x *21*			
299.370+x *21*	0,1		

† x=30 *10*; calculated value for the energy difference of configuration=((π 5/2[642])+(ν 9/2[734])) and configuration=((π 5/2[642])-(ν 9/2[734])), the expected configurations of ^{246}Am (7$^-$) g.s. and ^{246}Am $2^{(-)}$ isomeric state (1984So03), respectively.
‡ From least squares fit to Eγ data by the evaluator.
# From Adopted Levels.

β^- radiations

E(decay)[‡]	E(level)	Iβ^-[†#]	Log *ft*[‡]	Comments
(50.8[&] *syst*)	299.370+x	0.71 *5*	7.34 *20*	av Eβ=26.4 *38*
(84.1[&] *syst*)	232.761+x	≤0.32	≥8.4	av Eβ=44.7 *40*
(88.6[&] *syst*)	223.742+x	89 *5*	5.99 *12*	av Eβ=47.2 *40* E(decay): 150 keV *10* from Fermi plot (1956Ho23). Iβ^-: ≈90% (1965St10).
(179[&] *syst*)	43.806+x	9 *5*	7.94 *25*	av Eβ=100.4 *44* E(decay): 330 keV *30* from Fermi plot (1956Ho23). Iβ^-: ≈10% (1965St10).
(192[@&] *syst*)	16.21+x			
(201[&] *syst*)	0.0+x	<2	>8.6^{1u}	av Eβ=119.0 *42* Iβ^-: Deduced by evaluator from log $f^{1u}t$≥8.5. 1 *1* used in the calculation for the purpose of determining the gamma ray intensity.

† From intensity balance in the level scheme, except as noted. 1956Ho23 deduced Iβ(150)/Iβ(330)=2.7 from Fermi plots of β^- spectrum in coincidence with the 179γ and 44γ.
‡ Calculated assuming X=0.
# Absolute intensity per 100 decays.
@ Existence of this branch is questionable.
& Estimated for a range of levels.

^{246}Pu β^- decay 1971Mu05 (continued)

$\gamma(^{246}Am)$

Iγ normalization: From ΣI(γ+ce)(to 0+X and 16.2+X levels)=100−Iβ to 0.0+X. with Iβ to 0.0+X= 1 *1* used in the calculation. The uncertainty does not include possible error due to β^- feeding of the 16.22+x keV level.

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	α[@]	Comments
(16.22)		16.21+x	(0−,1−,2−)	0.0+x	(2−)			
27.58 *2*	14.1 *15*	43.806+x	(1+)	16.21+x	(0−,1−,2−)	(E1)[#]	3.90 *6*	α(L)=2.89 *4*; α(M)=0.759 *11* α(N)=0.2030 *29*; α(O)=0.0461 *7*; α(P)=0.00608 *9*; α(Q)=0.0001418 *20* %Iγ=3.6 *4*
43.81 *2*	100 *5*	43.806+x	(1+)	0.0+x	(2−)	(E1)[#]	1.175 *17*	α(L)=0.877 *12*; α(M)=0.2220 *31* α(N)=0.0596 *8*; α(O)=0.01394 *20*; α(P)=0.002061 *29*; α(Q)=5.75×10^{-5} *8* %Iγ=25.4 *16*
66.60 *2*	1.02 *7*	299.370+x	0,1	232.761+x				%Iγ=0.259 *21*
75.64 *2*	0.72 *10*	299.370+x	0,1	223.742+x	(1+)			%Iγ=0.183 *27*
149.42 *3*	0.23 *19*	223.742+x	(1+)	74.331+x				%Iγ=0.06 *5*
158.42 *3*	0.14 *3*	232.761+x		74.331+x		[E1,M1]	4 *4*	α(K)=3.1 *30*; α(L)=0.6 *6*; α(M)=0.16 *15* α(N)=0.04 *4*; α(O)=0.011 *10*; α(P)=0.0021 *20*; α(Q)=1.3×10^{-4} *13* %Iγ=0.036 *8*
179.94 *2*	38.8 *19*	223.742+x	(1+)	43.806+x	(1+)	(M1)	5.46 *8*	α(K)=4.30 *6*; α(L)=0.872 *12*; α(M)=0.2127 *30* α(N)=0.0581 *8*; α(O)=0.01464 *20*; α(P)=0.00280 *4*; α(Q)=0.0001780 *25* %Iγ=9.9 *6* Mult.: From α(K)exp≈6 (1956Ho23), K/L≠4.8 (1956Ho23 from magnetic spectrometer data, previously ≈5 in 1956Sm85). Iγ(180)/Iγ(224)=0.46 *7* (1991Po17).
189.00 *4*	0.19 *3*	232.761+x		43.806+x	(1+)			%Iγ=0.048 *8*
216.55 *4*	0.45 *7*	232.761+x		16.21+x	(0−,1−,2−)			%Iγ=0.114 *18*
223.75 *2*	94 *7*	223.742+x	(1+)	0.0+x	(2−)	(E1)[#]	0.0811 *11*	α(K)=0.0633 *9*; α(L)=0.01346 *19*; α(M)=0.00329 *5* α(N)=0.000891 *12*; α(O)=0.0002191 *31*; α(P)=3.90×10^{-5} *5*; α(Q)=1.837×10^{-6} *26* %Iγ=23.9 *20*
232.75 *3*	0.32 *5*	232.761+x		0.0+x	(2−)			%Iγ=0.081 *13*
255.54 *3*	0.92 *7*	299.370+x	0,1	43.806+x	(1+)			%Iγ=0.234 *20*
299.34 *6*	0.12 *3*	299.370+x	0,1	0.0+x	(2−)			%Iγ=0.031 *8*

† From 1971Mu05.
‡ All multipolarities are provided in the Adopted Gammas.

Continued on next page (footnotes at end of table)

^{246}Pu β^- decay 1971Mu05 (continued)

$\gamma(^{246}$Am) (continued)

[#] E1 assignment is based on intensity balance considerations.
[@] Additional information 4.
[&] For absolute intensity per 100 decays, multiply by 0.254 *10*.

^{246}Pu β^- decay 1971Mu05

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays