^{245}Am β^- decay 2019Ah02,1967Bu09

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

Parent: ^{245}Am: E=0.0; $J^\pi=5/2^+$; $T_{1/2}$=2.05 h *1*; Q(β^-)=895.9 *15*; %β^- decay=100

^{245}Am-Q(β^-): From 2021Wa16.

2019Ah02: The measurements were done in the early 1970s where gamma rays were detected using a Ge(Li) detector. The data taken in the 1970s were analyzed by the authors and the ^{245}Am decay scheme was deduced and extended from prior known level scheme.

1968WaZZ: ^{245}Am the daughter product of ^{245}Pu that was produced at the Oak Ridge Research Reactor from neutron incident on enriched ^{244}Pu. Gamma rays were measured with a Ge(Li) detector with a FWHM=2.48 keV for 1.332-MeV γ rays.

1967Bu09: The gammas were detected with Ge(Li), Na(Tl) and Si(Au) detectors and their intensities relative to the β decay rate were determined with a gas-flow proportional counter. Conversion electron spectra were measured with a Si(Au) detector. Determined absolute intensity of the 252-keV γ-ray.

1955Br02: Beta spectrum was studied with a thin lens magnetic spectrometer. Gammas were measured with NaI(Tl) detectors. Measured K and L conversion lines, γ, $\gamma\gamma$-coin. Proposed preliminary level scheme with a total disintegration energy of 1.32 MeV.

^{245}Cm Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	$7/2^+$	8423 y *74*	Configuration=$7/2^+$[624]. $T_{1/2}$: From Adopted Levels.
54.770 *19*	$9/2^+$	≤0.10 ns	$T_{1/2}$: From Adopted Levels.
121.29 *8*	$11/2^+$		
252.78 *5*	$5/2^+$		Configuration=$5/2^+$[622].
295.65 *5*	$7/2^+$		
388.28 *7*	$9/2^-$	0.450 ns *20*	$T_{1/2}$: From Adopted Levels. Configuration=$9/2^-$[734].
633.08 *30*	$(3/2)^-$		Configuration=$2^-\otimes 7/2^-$[624].
643.69 *7*	$7/2^-$		Configuration=$7/2^-$[743].

† From least-squares fit to Eγ data by the evaluator.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(252.2 *15*)	643.69	0.18	7.1	av Eβ=68.77 *44*
(262.8 *15*)	633.08	0.0040 *8*	8.80 *9*	av Eβ=71.89 *46*
(507.6 *15*)	388.28	0.03	8.8[1u]	av Eβ=147.96 *49*
(600.3 *15*)	295.65	0.73 *6*	7.69 *4*	av Eβ=178.50 *51*
(643.1 *15*)	252.78	18.2 *13*	6.40 *4*	av Eβ=192.91 *51*
(895.9 *15*)	0.0	80.9 *13*	6.238 *8*	av Eβ=280.90 *54* E(decay): Other: 905 keV *5* (1955Br02), 895.6 keV *21* derived by 2019Ah02 using closed decay cycle (See. Fig.2 in 2019Ah02).

† From intensity balance.
‡ Absolute intensity per 100 decays.

^{245}Am β^- decay 2019Ah02,1967Bu09 (continued)

$\gamma(^{245}Cm)$

Iγ normalization: Deduced by 2019Ah02 from weighted average %I(252.8γ)=6.1 6 (1967Bu09) and %I(252.8γ)=5.2 5 (2013Ah03). Other: %I(252.8γ)=3.09 *6* (1994Po30).

Measured x-ray intensities (2019Ah02)

Energy	Intensity	x-ray
104.68 *8*	50 *5*	Cm $K_{\alpha 2}$
109.36 *4*	78 *4*	Cm $K_{\alpha 1}$
123.04 *1*	29.8 *20*	Cm $K_{\beta 1}$
127.09 *1*	10.5 *5*	Cm $K_{\beta 2}$

Others: 1990Po14

E_γ	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[@]	Comments
42.87 *2*	0.46 *calc*	295.65	7/2$^+$	252.78	5/2$^+$				%Iγ=0.0258 calc I_γ: Deduced by evaluator from the branching ratios of 240.89γ and 42.87γ observed in ^{249}Cf α decay. E_γ: From ^{249}Cf α decay. Eγ=36 *5* was measured by 1955Br02.
54.77[‡] *2*		54.770	9/2$^+$	0.0	7/2$^+$				E_γ: From Adopted Gammas.
[x]≈78[‡][a]									
[x]111[‡] *5*									
[x]123[‡] *5*									
[x]140[‡] *5*									
[x]153[‡] *5*									
198.0[†] *1*	0.46[†] *4*	252.78	5/2$^+$	54.770	9/2$^+$	E2		1.023 *14*	α(K)=0.1475 *21*; α(L)=0.634 *9*; α(M)=0.1778 *25* α(N)=0.0494 *7*; α(O)=0.01203 *17*; α(P)=0.002046 *29*; α(Q)=1.829×10^{-5} *26* %Iγ=0.0258 *29*
240.9[†] *1*	2.72[†] *14*	295.65	7/2$^+$	54.770	9/2$^+$	M1		2.63 *4*	α(K)=2.064 *29*; α(L)=0.423 *6*; α(M)=0.1033 *15* α(N)=0.0284 *4*; α(O)=0.00722 *10*; α(P)=0.001421 *20*; α(Q)=0.0001015 *14* %Iγ=0.152 *14*
252.8[†] *1*	100[†]	252.78	5/2$^+$	0.0	7/2$^+$	M1+E2	0.16 *+6−4*	2.25 *5*	α(K)=1.76 *4*; α(L)=0.366 *6*; α(M)=0.0896 *14* α(N)=0.0246 *4*; α(O)=0.00626 *10*; α(P)=0.001229 *20*; α(Q)=8.66×10^{-5} *21* %Iγ=5.6 *4*

$^{245}_{96}Cm_{149}$-2

^{245}Am β^- decay 2019Ah02,1967Bu09 (continued)

$\gamma(^{245}Cm)$ (continued)

E_γ	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[@]	Comments
									Mult.,δ: As given in the Adopted Gammas. Values derived from K/L=5.1 *6* (1967Bu09), L/M=3.5 *10* (1967Bu09), K/L= 5 *1* (1955Br02). %Iγ=6.1 *6* (1967Bu09), %Iγ=5.6 4 (2019Ah02).
255.6[†] *2*	≈0.7[†]	643.69	7/2$^-$	388.28	9/2$^-$	M1(+E2)	0.19 *23*	2.16 *21*	α(K)=1.69 *19*; α(L)=0.353 *17*; α(M)=0.0866 *33* α(N)=0.0238 *9*; α(O)=0.00605 *24*; α(P)=0.00119 *6*; α(Q)=8.3×10^{-5} *9* %Iγ≈0.039
266.99[†] *3*	0.05[†] *1*	388.28	9/2$^-$	121.29	11/2$^+$	E1+M2	0.076 *+7−8*	0.094 *8*	α(K)=0.069 *5*; α(L)=0.0182 *18*; α(M)=0.0046 *5* α(N)=0.00128 *13*; α(O)=0.000322 *34*; α(P)=6.1×10^{-5} *7*; α(Q)=3.7×10^{-6} *4* %Iγ=0.0028 *6*
295.7[†] *1*	1.20[†] *7*	295.65	7/2$^+$	0.0	7/2$^+$	M1+E2	0.39 *+17−24*	1.32 *14*	α(K)=1.02 *12*; α(L)=0.223 *13*; α(M)=0.0550 *28* α(N)=0.0151 *8*; α(O)=0.00384 *20*; α(P)=0.00075 *5*; α(Q)=5.0×10^{-5} *6* %Iγ=0.067 *6*
333.5[†] *1*	0.52[†] *4*	388.28	9/2$^-$	54.770	9/2$^+$	(E1)		0.0348 *5*	α(K)=0.0274 *4*; α(L)=0.00553 *8*; α(M)=0.001346 *19* α(N)=0.000367 *5*; α(O)=9.19×10^{-5} *13*; α(P)=1.724×10^{-5} *24*; α(Q)=9.90×10^{-7} *14* %Iγ=0.0291 *31*
348.0[†] *2*	0.125[†] *15*	643.69	7/2$^-$	295.65	7/2$^+$				%Iγ=0.0070 *10*
380.3[†] *3*	0.070[†] *12*	633.08	(3/2)$^-$	252.78	5/2$^+$	E1		0.0265 *4*	α(K)=0.02097 *30*; α(L)=0.00414 *6*; α(M)=0.001006 *14* α(N)=0.000275 *4*; α(O)=6.89×10^{-5} *10*; α(P)=1.299×10^{-5} *18*; α(Q)=7.67×10^{-7} *11* %Iγ=0.0039 *7*
388.3[†] *1*	2.07[†] *11*	388.28	9/2$^-$	0.0	7/2$^+$	(E1)		0.0254 *4*	α(K)=0.02011 *28*; α(L)=0.00396 *6*; α(M)=0.000962 *13* α(N)=0.000262 *4*; α(O)=6.59×10^{-5} *9*; α(P)=1.243×10^{-5} *17*; α(Q)=7.37×10^{-7} *10* %Iγ=0.116 *10*
391.0[†] *1*	0.51[†] *4*	643.69	7/2$^-$	252.78	5/2$^+$				%Iγ=0.0286 *30*
643.6[†] *1*	0.27[†] *3*	643.69	7/2$^-$	0.0	7/2$^+$				%Iγ=0.0151 *20*

[†] From 2019Ah02.
[‡] From 1955Br02.
[#] From Adopted Gammas, except as noted.
[@] Additional information 1.
[&] For absolute intensity per 100 decays, multiply by 0.056 *4*.

$^{245}_{96}Cm_{149}$-3

γ(^{245}Cm) (continued)

[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{245}_{96}Cm_{149}$-4

^{245}Am β^- decay 2019Ah02,1967Bu09

Decay Scheme

Intensities: I_γ per 100 parent decays