^{242}Am ε decay (16.01 h)

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin, C. D. Nesaraja	NDS 186, 261 (2022)	31-Dec-2021

Parent: ^{242}Am: E=0.0; $J^\pi=1^-$; $T_{1/2}$=16.01 h *2*; Q(ε)=751.1 *7*; %ε decay=17.0 *3*
^{242}Am-Q(ε): From 2021Wa16.

^{242}Pu Levels

E(level)	J^π	$T_{1/2}$
0.0	0^+	3.73×10^5 y *2*
44.542 *25*	2^+	160 ps *3*

ε radiations

E(decay)	E(level)	Iε[†][‡]	Log *ft*	Comments
(706.6 *7*)	44.542	11.2 *23*	8.0 *1*	εK=0.7255; εL=0.20114 *5*; εM+=0.07340 *3*
(751.1 *7*)	0.0	5.8 *23*	8.4 *2*	εK=0.7297; εL=0.19819 *5*; εM+=0.07211 *2*

† I(ε to the 44 level=I(γ+ce 44γ). I(ε to the gs=(17.0 *3*- I(γ+ce 44γ).
‡ Absolute intensity per 100 decays.

γ(^{242}Pu)

See 1955Ho67 for L x ray subshell energies and relative intensities.
I[L x ray(Pu)]/I[L x ray(Cm)]=0.415 (cryst) 1955Ho67.
I[L x ray(Pu)]/I[L x ray(Cm)]=0.587 (cryst) 1950Ok52.

The calculated K x ray and L x ray intensities from the decay scheme are I(K x ray)=11.9% *2* and I(L x ray)=5.2% *8*.

Pu x-rays:

E(x-ray) 1980VyZZ	I(x-ray) 1980VyZZ ×	(%) 1955Ho67 #	
17.35	11 *2*	5.1	L x ray
99.552			$K\alpha_2$ x ray
103.761			$K\alpha_1$ x ray
117.3			$K\beta_1'$ x ray
120.5			$K\beta_2'$ x ray
	11.7 *17*	(11.7)	Total K x ray

×Intensities were given relative to Iγ(44.54γ)=0.015 *3*.
Normalized by the evaluators to I(K x-ray)=11.7;
I(L x ray)/I(K x ray)=37/85 was given by 1955Ho67

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
44.542 *25*	0.015 *3*	44.542	2^+	0.0	0^+	E2	748 *11*	α(L)=543 *8*; α(M)=151.5 *22* α(N)=41.6 *6*; α(O)=9.78 *14*; α(P)=1.530 *22*; α(Q)=0.00328 *5* E_γ: From 1980VyZZ. Others: 44.52 *10* (1955Ba31), 44.50 *6* (1956Al41), 44.55 (1960As05). The uncertainty in the

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^{242}Am ε decay (16.01 h) (continued)

$\gamma(^{242}Pu)$ (continued)

E_γ	E_i(level)	Comments
		value of 1955Ba31 comes from 1956Ho54.
		I_γ: photons per 100 ^{242}Am ε decays from 1980VyZZ. Other: 0.014 from work of 1955Ba31. These authors measured the total conversion electrons of the 44.5γ relative to the β intensity from ^{242}Am β^- decay to be 154/1200, with no quoted uncertainty. This ratio, along with $\%\beta^-$=83.0 gives Ice(44.5γ)=10.7 per 100 ^{242}Am decays and thus Iγ=0.014, in excellent agreement with the value from 1980VyZZ. The authors of 1955Ho67 measured I[ce(L1)+ce(L2) 44.545γ from Am ε decay]:I(ce 42.13γ) from Am β^- decay)=360:1380.
		Mult.: From L2/L3=1.4 (1955Ho67). See also 1955Ba31.

† Additional information 1.
‡ Absolute intensity per 100 decays.

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Decay Scheme

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