



1 Decay Scheme

Am-242 decays by beta- emission to the first excited level and ground state of Cm-242 (83.1 %), and by electron capture decay to the first excited level and ground state of Pu-242 (16.9 %).

L'américium 242 se désintègre par émission bêta moins (83,1 %) vers un niveau excité et le niveau fondamental de curium 242, et par capture électronique vers le plutonium 242.

2 Nuclear Data

$T_{1/2}({}^{242}\text{Am})$:	16,01	(2)	h
$T_{1/2}({}^{242}\text{Pu})$:	3,73	(3)	10^5 a
$T_{1/2}({}^{242}\text{Cm})$:	162,86	(8)	d
$Q^-({}^{242}\text{Am})$:	664,5	(4)	keV
$Q^+({}^{242}\text{Am})$:	751,3	(7)	keV

2.1 β^- Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft
$\beta_{0,1}^-$	622,4 (4)	45,8 (23)	1st forbidden non-unique	6,84
$\beta_{0,0}^-$	664,5 (4)	37,3 (23)	1st forbidden non-unique	7,03

2.2 Electron Capture Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,1}$	706,8 (7)	10,6 (5)	1st forbidden non-unique	7,26	0,7261 (23)	0,2016 (15)	0,0532 (10)
$\epsilon_{0,0}$	751,3 (7)	6,3 (6)	1st forbidden non-unique	7,55	0,7303 (22)	0,1987 (15)	0,0522 (10)

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_L	α_M	α_T
$\gamma_{1,0}(\text{Cm})$	42,13 (5)	45,8 (23)	E2	836 (13)	235 (4)	1155 (17)
$\gamma_{1,0}(\text{Pu})$	44,54 (2)	10,6 (5)	E2	543 (8)	151,6 (22)	748 (11)

3 Atomic Data

3.1 Pu

ω_K	:	0,971	(4)
$\bar{\omega}_L$:	0,521	(20)
n_{KL}	:	0,790	(5)

3.1.1 X Radiations

	Energy keV	Relative probability	
X _K	K α_2	99,525	
	K α_1	103,734	
	K β_3	116,244	}
	K β_1	117,228	}
	K β_5''	117,918	}
	K β_2	120,54	}
	K β_4	120,969	}
	KO _{2,3}	121,543	}
	X _L	L ℓ	12,124
		L α	14,087 – 14,282
L η		16,333	
L β		16,498 – 18,541	
L γ		21,42 – 22,153	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K	KLL	75,263 – 85,357
	KLX	92,607 – 103,729
	KXY	109,93 – 121,78
Auger L	6,09 – 13,83	4700

3.2 Cm

ω_K	:	0,972	(4)
$\bar{\omega}_L$:	0,538	(23)
n_{KL}	:	0,785	(5)

3.2.1 X Radiations

	Energy keV	Relative probability
X _L		
L ℓ	12,633	
L α	14,746 – 14,961	
L η	17,314	
L β	17,286 – 19,688	
L γ	22,735 – 23,527	

3.2.2 Auger Electrons

	Energy keV	Relative probability
Auger L	6,19 – 14,46	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Pu)	6,09 - 13,83	9,9 (5)
e _{AK}	(Pu)		0,36 (4)
	KLL	75,263 - 85,357	}
	KLX	92,607 - 103,729	}
	KXY	109,93 - 121,78	}
e _{AL}	(Cm)	6,19 - 14,46	15,4 (10)
e _{AK}	(Cm)		
ec _{1,0 L}	(Cm)	17,60 - 23,16	33,1 (18)
ec _{1,0 L}	(Pu)	21,44 - 26,48	7,7 (4)
ec _{1,0 M₊}	(Cm)	35,79 - 38,12	12,6 (7)
ec _{1,0 M₊}	(Pu)	38,61 - 44,53	2,9 (2)
$\beta_{0,1}^-$	max:	622,4 (4)	45,8 (23)
$\beta_{0,1}^-$	avg:	185,92 (14)	
$\beta_{0,0}^-$	max:	664,5 (4)	37,3 (23)
$\beta_{0,0}^-$	avg:	200,17 (14)	

5 Photon Emissions

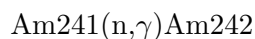
5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Pu)	12,124 — 22,153	10,8 (5)	
XK α_2	(Pu)	99,525	3,55 (17)	} K α
XK α_1	(Pu)	103,734	5,6 (3)	
XK β_3	(Pu)	116,244	}	} K' β_1
XK β_1	(Pu)	117,228	}	
XK β_5''	(Pu)	117,918	}	
XK β_2	(Pu)	120,54	}	} K' β_2
XK β_4	(Pu)	120,969	}	
XKO _{2,3}	(Pu)	121,543	}	
XL	(Cm)	12,633 — 23,527	18,0 (11)	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.	
$\gamma_{1,0}(\text{Cm})$	42,13 (5)	0,040 (2)	
$\gamma_{1,0}(\text{Pu})$	44,54 (2)	0,014 (1)	

6 Main Production Modes



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