



1 Decay Scheme

Cs-137 disintegrates by beta minus emission to the ground state of Ba-137 (5,6 %) and via the 661 keV isomeric level of Ba-137 (94,4 %) which has a half-life of 2,55 min.

Le césium 137 se désintègre par émission bêta moins vers le niveau fondamental de barium 137 (5,6 %) ainsi que vers le niveau isomère de 661 keV (94,4 %) et de 2,55 min de période.

2 Nuclear Data

$$T_{1/2}({}^{137}\text{Cs}) : 30,05 \quad (8) \quad \text{a}$$

$$Q^{-}({}^{137}\text{Cs}) : 1175,63 \quad (17) \quad \text{keV}$$

2.1 β^{-} Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft
$\beta_{0,2}^{-}$	513,97 (17)	94,36 (28)	Unique 1st Forbidden	9,63
$\beta_{0,1}^{-}$	892,1 (2)	0,00061 (8)	Unique 2nd Forbidden	15,64
$\beta_{0,0}^{-}$	1175,63 (17)	5,64 (28)	2nd Forbidden	12,06

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}(\text{Ba})$	283,5 (1)	0,00061 (8)	[M1,E2]	0,046 (3)	0,0073 (10)	0,0015 (2)	0,0557 (13)
$\gamma_{2,0}(\text{Ba})$	661,659 (3)	94,36 (20)	M4	0,0896 (15)	0,0165 (5)	0,00352 (7)	0,1102 (19)

3 Atomic Data

3.1 Ba

$$\omega_K : 0,900 \quad (4)$$

$$\bar{\omega}_L : 0,110 \quad (5)$$

$$n_{KL} : 0,888 \quad (4)$$

3.1.1 X Radiations

	Energy keV	Relative probability		
X _K	K α_2	31,8174	54,28	
	K α_1	32,1939	100	
	K β_3	36,3045	}	
	K β_1	36,3786	}	
	K β_5''	36,654	}	29,4
	K β_2	37,258	}	
	K β_4	37,312	}	7,42
	KO _{2,3}	37,425	}	
	X _L	L ℓ	3,954	
		L γ	– 5,809	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	25,314 – 26,786	100
KLX	30,095 – 32,179	47,7
KXY	34,86 – 37,41	5,7
Auger L	2,6 – 5,8	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Ba)	2,6 - 5,8	7,28 (12)
e _{AK}	(Ba)		0,76 (4)
	KLL	25,314 - 26,786	}
	KLX	30,095 - 32,179	}
	KXY	34,86 - 37,41	}
ec _{2,0 T}	(Ba)	624,218 - 661,644	9,37 (14)
ec _{2,0 K}	(Ba)	624,218 (3)	7,62 (13)
ec _{2,0 L}	(Ba)	655,670 - 656,412	1,40 (4)
ec _{2,0 M}	(Ba)	660,366 - 660,878	0,299 (6)
$\beta_{0,2}^-$	max:	513,97 (17)	94,36 (28)
$\beta_{0,2}^-$	avg:	174,32 (6)	
$\beta_{0,1}^-$	max:	892,1 (2)	0,00061 (8)
$\beta_{0,1}^-$	avg:	300,57 (8)	
$\beta_{0,0}^-$	max:	1175,63 (17)	5,64 (28)
$\beta_{0,0}^-$	avg:	416,26 (8)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.
XL	(Ba)	3,954 — 5,809	0,90 (5)
XK α_2	(Ba)	31,8174	1,95 (4) } K α
XK α_1	(Ba)	32,1939	3,59 (7) }
XK β_3	(Ba)	36,3045	}
XK β_1	(Ba)	36,3786	} 1,055 (22) K' β_1
XK β_5''	(Ba)	36,654	}
XK β_2	(Ba)	37,258	}
XK β_4	(Ba)	37,312	} 0,266 (8) K' β_2
XKO _{2,3}	(Ba)	37,425	}

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}(\text{Ba})$	283,5 (1)	0,00058 (8)
$\gamma_{2,0}(\text{Ba})$	661,657 (3)	84,99 (20)

6 Main Production Modes

Fission product.

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