$^{137}_{55}\mathrm{Cs}_{82}$

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 désintégre 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

$T_{1/2}(^{137}\mathrm{Cs}\ )$: 30,05 (8) a
$Q^{-}(^{137}\mathrm{Cs}\ )$: 1175,63 (17) keV

2.1 β^- Transitions

	Energy keV	Probability × 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	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}$(Ba)	283,5 (1)	0,00061 (8)	[M1,E2]	0,046 (3)	0,0073 (10)	0,0015 (2)	0,0557 (13)
$\gamma_{2,0}$(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

ω_K : 0,900 (4)
$\bar{\omega}_L$: 0,110 (5)
n_{KL} : 0,888 (4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	31,8174		54,28
	$K\alpha_1$	32,1939		100
	$K\beta_3$	36,3045	}	
	$K\beta_1$	36,3786	}	
	$K\beta_5''$	36,654	}	29,4
	$K\beta_2$	37,258	}	
	$K\beta_4$	37,312	}	7,42
	$KO_{2,3}$	37,425	}	
X_L				
	$L\ell$	3,954		
	$L\gamma$	– 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)	
$XK\alpha_2$	(Ba)	31,8174	1,95 (4)	} Kα
$XK\alpha_1$	(Ba)	32,1939	3,59 (7)	}
$XK\beta_3$	(Ba)	36,3045 }		
$XK\beta_1$	(Ba)	36,3786 }	1,055 (22)	$K'\beta_1$
$XK\beta''_5$	(Ba)	36,654 }		
$XK\beta_2$	(Ba)	37,258 }		
$XK\beta_4$	(Ba)	37,312 }	0,266 (8)	$K'\beta_2$
$XKO_{2,3}$	(Ba)	37,425 }		

5.2 Gamma Emissions

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

6 Main Production Modes

Fission product.

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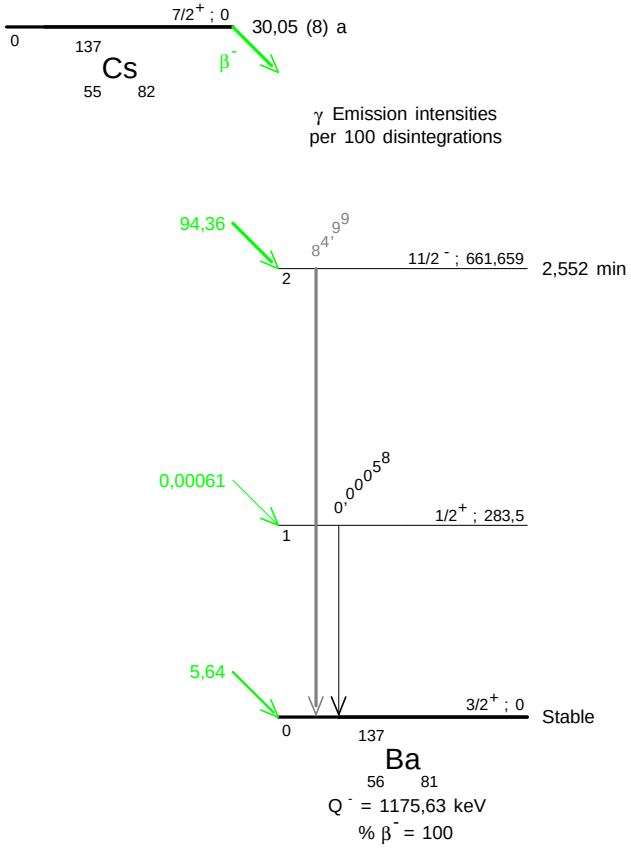
7/2+ ; 0
30,05 (8) a
0
137
Cs
55
82
β-
γ Emission intensities
per 100 disintegrations
94,36
8
4,9
9
11/2 - ; 661,659
2,552 min
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0,
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0
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5
8
1/2+ ; 283,5
1
5,64
3/2+ ; 0
Stable
0
137
Ba
56
81
Q - = 1175,63 keV
% β- = 100