$^{133}_{54}\mathrm{Xe}_{79}$

1 Decay Scheme

Xe-133 disintegrates by beta minus emission to the excited levels of Cs-133.
Le xénon 133 se désintègre vers des niveaux excités du césium 133.

2 Nuclear Data

$T_{1/2}(^{133}\mathrm{Xe}\ )$: 5,2474 (5) d
$Q^{-}(^{133}\mathrm{Xe}\ )$: 427,4 (24) keV

2.1 β^{-} Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^{-}_{0,3}$	43,6 (24)	0,0092 (9)	Allowed	6,84
$\beta^{-}_{0,2}$	266,8 (24)	0,87 (8)	Allowed	7,31
$\beta^{-}_{0,1}$	346,4 (24)	99,12 (8)	Allowed	5,62

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{2,1}$(Cs)	79,6142 (12)	0,78 (8)	M1+1,54%E2	1,495 (21)	0,217 (6)	0,0447 (12)	1,768 (26)
$\gamma_{1,0}$(Cs)	80,9979 (11)	99,8 (12)	M1+E2	1,429 (20)	0,214 (3)	0,0442 (6)	1,698 (24)
$\gamma_{2,0}$(Cs)	160,6120 (16)	0,088 (10)	M1+E2	0,234 (4)	0,0471 (13)	0,0099 (3)	0,294 (5)
$\gamma_{3,2}$(Cs)	223,2368 (13)	0,00019 (7)	M1+E2	0,0836 (12)	0,01103 (16)	0,00226 (3)	0,0975 (14)
$\gamma_{3,1}$(Cs)	302,8508 (5)	0,0061 (8)	M1+0,05%E2	0,0373 (5)	0,00484 (7)	0,000988 (14)	0,0434 (6)
$\gamma_{3,0}$(Cs)	383,8485 (12)	0,0029 (4)	E2	0,01684 (24)	0,00269 (4)	0,000559 (8)	0,0202 (3)

3 Atomic Data

3.1 Cs

ω_K : 0,894 (4)
$\bar{\omega}_L$: 0,104 (5)
n_{KL} : 0,895 (4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	30,6254		54,13
	$K\alpha_1$	30,9731		100
	$K\beta_3$	34,9197	}	
	$K\beta_1$	34,9873	}	
	$K\beta_5''$	35,252	}	29,22
	$K\beta_2$	35,822	}	
	$K\beta_4$	35,907	}	7,13
	$KO_{2,3}$	35,972	}	
X_L				
	$L\ell$	3,795		
	$L\alpha$	4,273 – 4,287		
	$L\eta$	4,142		
	$L\beta$	4,62 – 4,988		
	$L\gamma$	5,131 – 5,553		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	24,411 – 25,804	100
KLX	28,991 – 30,961	47,2
KXY	33,55 – 35,96	5,56
Auger L	2,5 – 5,6	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Cs)	2,5 - 5,6	49,9 (3)
e_{AK}	(Cs)		5,65 (24)
	KLL	24,411 - 25,804	}
	KLX	28,991 - 30,961	}
	KXY	33,55 - 35,96	}
$ec_{2,1\ K}$	(Cs)	43,6295 (19)	0,419 (45)
$ec_{1,0\ T}$	(Cs)	45,0133 - 80,9865	62,8 (10)
$ec_{1,0\ K}$	(Cs)	45,0133 (11)	52,9 (9)
$ec_{2,1\ L}$	(Cs)	73,8998 - 74,6022	0,061 (7)
$ec_{1,0\ L}$	(Cs)	75,2836 - 75,9860	7,92 (13)
$ec_{1,0\ M}$	(Cs)	79,7808 - 80,2724	1,635 (26)
$ec_{1,0\ N}$	(Cs)	80,7671 - 80,9214	0,3441 (46)
$\beta^-_{0,3}$	max:	43,6 (24)	0,0092 (9)
$\beta^-_{0,3}$	avg:	11,1 (7)	
$\beta^-_{0,2}$	max:	266,8 (24)	0,87 (8)
$\beta^-_{0,2}$	avg:	75,2 (8)	
$\beta^-_{0,1}$	max:	346,4 (24)	99,12 (8)
$\beta^-_{0,1}$	avg:	100,6 (8)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Cs)	3,795 — 5,553	5,79 (11)	
$XK\alpha_2$	(Cs)	30,6254	13,54 (24)	} $K\alpha$
$XK\alpha_1$	(Cs)	30,9731	25,0 (5)	}
$XK\beta_3$	(Cs)	34,9197 }		
$XK\beta_1$	(Cs)	34,9873 }	7,31 (15)	$K'\beta_1$
$XK\beta''_5$	(Cs)	35,252 }		
$XK\beta_2$	(Cs)	35,822 }		
$XK\beta_4$	(Cs)	35,907 }	1,78 (6)	$K'\beta_2$
$XKO_{2,3}$	(Cs)	35,972 }		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{2,1}$(Cs)	79,6142 (12)	0,28 (3)
$\gamma_{1,0}$(Cs)	80,9979 (11)	37,0 (3)
$\gamma_{2,0}$(Cs)	160,6120 (16)	0,068 (8)
$\gamma_{3,2}$(Cs)	223,2368 (13)	0,00017 (6)
$\gamma_{3,1}$(Cs)	302,8508 (5)	0,0058 (8)
$\gamma_{3,0}$(Cs)	383,8485 (12)	0,0028 (4)

6 Main Production Modes

Fission product()
Possible impurities : Xe − 129, Xe − 131, Xe − 135

Te − 130(α,n)Xe − 133
Possible impurities : Xe − 125, Xe − 127, Xe − 135

Xe − 132(n,γ)Xe − 133 σ : 0,4 barns
Cs − 133(n,p)Xe − 133
Possible impurities : Xe − 135, Xe − 137

Ba − 136(n,α)Xe − 133
Possible impurities : Xe − 135, Xe − 137

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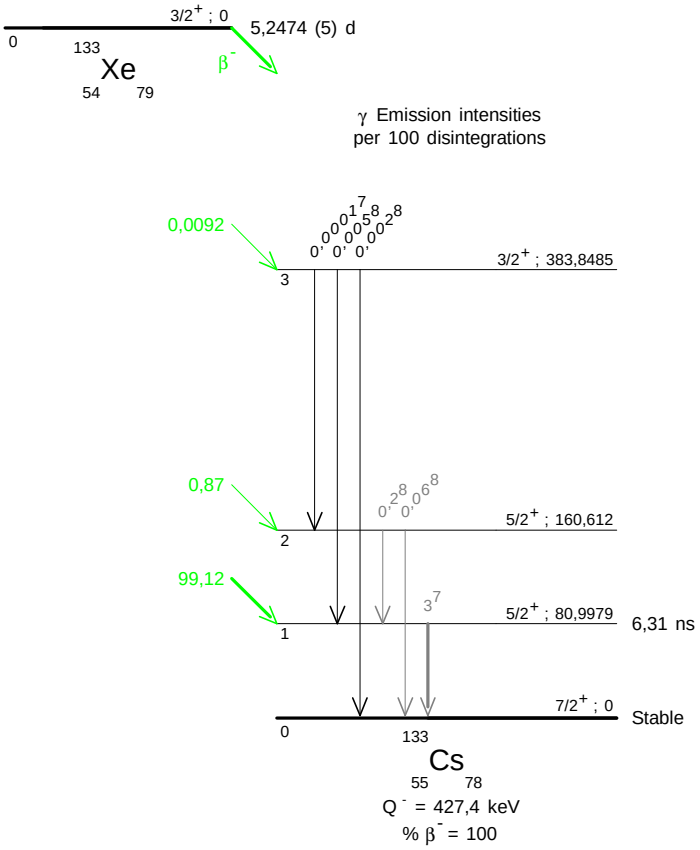
3/2+ ; 0
5,2474 (5) d
0
133
Xe
54
79
β-
γ Emission intensities
per 100 disintegrations
0,0092
0,87
99,12
3/2+ ; 383,8485
5/2+ ; 160,612
5/2+ ; 80,9979
6,31 ns
7/2+ ; 0
Stable
133
Cs
55
78
Q- = 427,4 keV
% β- = 100