$^{141}_{58}\mathrm{Ce}_{83}$

1 Decay Scheme

Ce-141 decays by beta minus emission. The main beta transition (70%) leads to the 145 keV level of Pr-141, the weaker beta transition (30%) feeds directly the ground state of Pr-141.
Le cérium 141 se désintègre par émission bêta principalement (70 %) vers le niveau excité de 145 keV du praséodyme 141 et pour 30 % vers le niveau fondamental.

2 Nuclear Data

$T_{1/2}(^{141}\mathrm{Ce}\ )$: 32,503 (11) d
$Q^{-}(^{141}\mathrm{Ce}\ )$: 580,4 (11) keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,1}$	435,0 (11)	69,97 (44)	1st forbidden	6,97
$\beta^-_{0,0}$	580,4 (11)	30,03 (44)	1st forbidden	7,76

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}$(Pr)	145,4433 (14)	69,97 (44)	M1+E2	0,383 (6)	0,0529 (8)	0,01116 (16)	0,449 (7)

3 Atomic Data

3.1 Pr

ω_K : 0,914 (4)
$\bar{\omega}_L$: 0,132 (5)
n_{KL} : 0,871 (4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	35,5506		54,76
	$K\alpha_1$	36,0267		100
	$K\beta_3$	40,6533	}	
	$K\beta_1$	40,7487	}	
	$K\beta_5''$	41,05	}	30,42
	$K\beta_2$	41,774	}	
	$K\beta_4$	41,877	}	7,79
	$KO_{2,3}$	41,968	}	
X_L				
	$L\ell$	4,458		
	$L\alpha$	5,0129 – 5,0343		
	$L\eta$	4,9337		
	$L\beta$	5,4887 – 5,9032		
	$L\gamma$	6,1375 – 6,617		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	28,162 – 29,890	100
KLX	33,576 – 36,004	49,4
KXY	38,97 – 41,95	6,1
Auger L	2,94 – 6,79	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Pr)	2,94 - 6,79	16,15 (11)
e_{AK}	(Pr)		1,59 (8)
	KLL	28,162 - 29,890	}
	KLX	33,576 - 36,004	}
	KXY	38,97 - 41,95	}
$ec_{1,0\ T}$	(Pr)	103,4527 - 145,4210	21,68 (35)
$ec_{1,0\ K}$	(Pr)	103,4527 (14)	18,5 (3)
$ec_{1,0\ L}$	(Pr)	138,6085 - 139,4790	2,555 (40)
$ec_{1,0\ M}$	(Pr)	143,932 - 144,512	0,539 (8)
$ec_{1,0\ N}$	(Pr)	145,1388 - 145,4410	0,1202 (20)
$\beta^-_{0,1}$	max:	435,0 (11)	69,97 (44)
$\beta^-_{0,1}$	avg:	129,7 (5)	
$\beta^-_{0,0}$	max:	580,4 (11)	30,03 (44)
$\beta^-_{0,0}$	avg:	180,8 (6)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Pr)	4,458 — 6,617	2,52 (5)	
$XK\alpha_2$	(Pr)	35,5506	4,80 (9)	} $K\alpha$
$XK\alpha_1$	(Pr)	36,0267	8,76 (15)	}
$XK\beta_3$	(Pr)	40,6533	}	
$XK\beta_1$	(Pr)	40,7487	} 2,67 (6)	$K'\beta_1$
$XK\beta''_5$	(Pr)	41,05	}	
$XK\beta_2$	(Pr)	41,774	}	
$XK\beta_4$	(Pr)	41,877	} 0,682 (20)	$K'\beta_2$
$XKO_{2,3}$	(Pr)	41,968	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}$(Pr)	145,4433 (14)	48,29 (19)

6 Main Production Modes

$\left\{ \begin{array}{l} Ce-140(n,\gamma)Ce-141 \qquad \sigma : 0{,}58\ (2)\ \text{barns} \\ \text{Possible impurities :}\ Ce-139,\ Ce-143,\ Ce-144 \end{array} \right.$

$Pr-141(n,p)Ce-141$

$La-139(n,\gamma)La-140 \qquad \sigma : 8{,}93\ (4)\ \text{barns}$

$\left\{ \begin{array}{l} La-140(n,\gamma)La-141 \\ \text{Possible impurities :}\ Ce-139 \end{array} \right.$

$La-141(\beta^-)Ce-141$

$\left\{ \begin{array}{l} \text{Fission product} \\ \text{Possible impurities :}\ Ce-139,\ Ce-143,\ Ce-144 \end{array} \right.$

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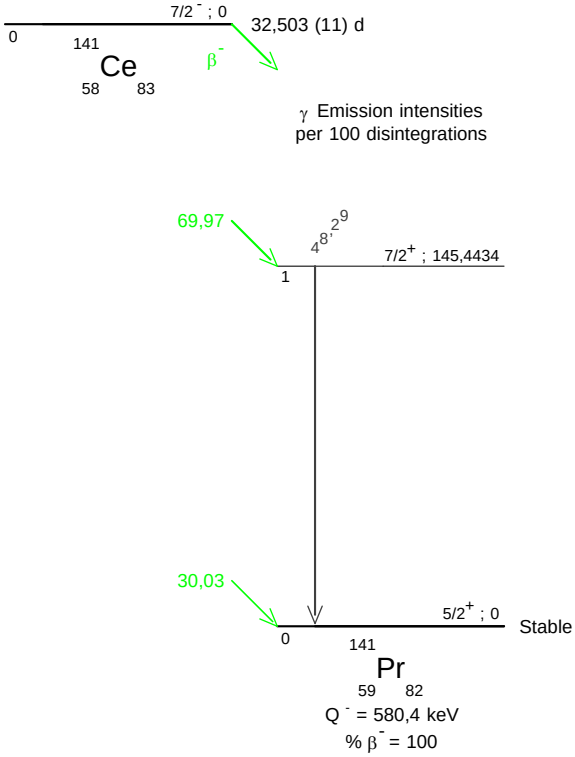
7/2⁻ ; 0
32,503 (11) d
0
141
Ce
58
83
β⁻
γ Emission intensities
per 100 disintegrations
69,97
4^8 2^9
7/2⁺ ; 145,4434
1
30,03
5/2⁺ ; 0
Stable
0
141
Pr
59
82
Q⁻ = 580,4 keV
% β⁻ = 100