$^{109}_{48}\mathrm{Cd}_{61}$

1 Decay Scheme

Cd-109 decays by electron capture to the isomeric state (88 keV) of Ag-109.
Le cadmium 109 se désintègre uniquement par capture électronique vers l'état isomérique de l'argent 109 (88 keV).

2 Nuclear Data

$T_{1/2}(^{109}\mathrm{Cd}\ )$: 461,4 (12) d
$Q^{+}(^{109}\mathrm{Cd}\ )$: 213,8 (27) keV

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,1}$	125,8 (27)	100	Allowed	5,1	0,8118 (23)	0,1497 (23)	0,0321 (8)
$\epsilon_{0,0}$	213,8 (27)	< 0,005	2nd Forbidden	11			

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}$(Ag)	88,0337 (1)	100	E3	11,28 (12)	12,34 (13)	2,70 (3)	26,58 (20)

3 Atomic Data

3.1 Ag

ω_K	:	0,831	(4)
$\bar{\omega}_L$	:	0,0583	(14)
n_{KL}	:	0,964	(4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	21,9906		53,05
	$K\alpha_1$	22,16317		100
	$K\beta_3$	24,9118	}	
	$K\beta_1$	24,9427	}	
	$K\beta_5''$	25,146	}	27,7
	$K\beta_2$	25,4567	}	
	$K\beta_4$	25,512	}	4,82
X_L				
	$L\ell$	2,63		
	$L\gamma$	– 3,75		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	17,79 – 18,69	100
KLX	20,945 – 22,160	42,5
KXY	24,079 – 25,507	4,51
Auger L	1,8 – 3,8	1194

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Ag)	1,8 - 3,8	167 (10)
e_{AK}	(Ag)		20,6 (5)
	KLL	17,79 - 18,69	}
	KLX	20,945 - 22,160	}
	KXY	24,079 - 25,507	}
$ec_{1,0\ K}$	(Ag)	62,520 (2)	40,8 (5)
$ec_{1,0\ L}$	(Ag)	84,228 - 84,683	44,8 (5)
$ec_{1,0\ M}$	(Ag)	87,316 - 88,030	9,28 (29)

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Ag)	2,63 — 3,75		10,34 (26)	
XKα_2	(Ag)	21,9906		29,00 (25)	} Kα
XKα_1	(Ag)	22,16317		54,7 (4)	}
XKβ_3	(Ag)	24,9118	}		
XKβ_1	(Ag)	24,9427	}	15,14 (18)	K$'\beta_1$
XKβ_5''	(Ag)	25,146	}		
XKβ_2	(Ag)	25,4567	}		
XKβ_4	(Ag)	25,512	}	2,64 (10)	K$'\beta_2$

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}$(Ag)	88,0336 (1)	3,626 (26)

6 Main Production Modes

$\left\{ \begin{array}{l} \mathrm{Cd-108(n,\gamma)Cd-109} \qquad \sigma : 1{,}1\ (3)\ \text{barns} \\ \text{Possible impurities :}\ \ \mathrm{Ag-110m} \end{array} \right.$

$\left\{ \begin{array}{l} \mathrm{Ag-109(p,n)Cd-109} \\ \text{Possible impurities :}\ \ \text{None} \end{array} \right.$

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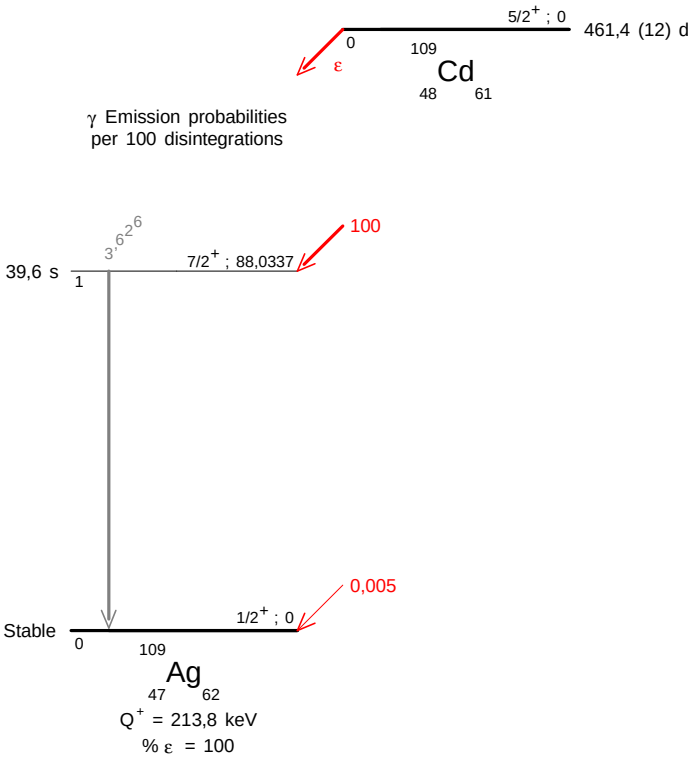
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ε
γ Emission probabilities
per 100 disintegrations
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Stable
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Q+ = 213,8 keV
% ε = 100