



1 Decay Scheme

Zn-65 disintegrates by electron capture to the 1115 keV excited level and by electron capture and beta plus emission to the ground state level of Cu-65.

Le Zn-65 se désintègre par capture électronique vers le niveau excité de 1115 keV du Cu-65 et par capture électronique et émission bêta plus vers le niveau fondamental.

2 Nuclear Data

$$T_{1/2}({}^{65}\text{Zn}) : 244,01 \text{ (9) d}$$

$$Q^+({}^{65}\text{Zn}) : 1352,1 \text{ (3) keV}$$

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>	<i>P_K</i>	<i>P_L</i>	<i>P_{M+}</i>
$\epsilon_{0,2}$	236,5 (3)	50,23 (11)	Allowed	5,89	0,8794 (17)	0,1027 (16)	0,0179
$\epsilon_{0,0}$	1352,1 (3)	48,35 (11)	Allowed	7,46	0,8853 (16)	0,0977 (15)	0,017

2.2 β^+ Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>
$\beta_{0,0}^+$	329,9 (3)	1,421 (7)	Allowed	7,46

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K (10^{-3})	α_L (10^{-3})	α_T (10^{-3})
$\gamma_{2,1}(\text{Cu})$	344,95 (20)	0,00256 (18)	[E2]	5,55 (17)	0,569 (19)	6,20 (19)
$\gamma_{1,0}(\text{Cu})$	770,64 (9)	0,00269 (22)	M1+0,9%E2	0,345 (10)	0,0343 (10)	0,384 (12)
$\gamma_{2,0}(\text{Cu})$	1115,549 (2)	50,23 (11)	M1+16,0%E2	0,166 (6)	0,0162 (5)	0,184 (7)

3 Atomic Data

3.1 Cu

ω_K	:	0,454	(4)
$\bar{\omega}_L$:	0,0097	(4)
n_{KL}	:	1,357	(4)

3.1.1 X Radiations

	Energy keV	Relative probability
X_K	$K\alpha_2$	8,02792
	$K\alpha_1$	8,04787
	$K\beta_1$	8,90539
	$K\beta_5''$	8,9771
X_L	$L\ell$	0,811
	$L\alpha$	0,929 – 0,93
	$L\beta$	0,932 – 1,022

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K	KLL	6,76 – 7,12
	KLX	7,76 – 8,05
	KXY	8,73 – 8,90
Auger L	0,7 – 1,0	346

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Cu)	0,7 - 1,0	126,6 (7)
e _{AK}	(Cu)		47,5 (4)
	KLL	6,76 - 7,12	}
	KLX	7,76 - 8,05	}
	KXY	8,73 - 8,90	}
$\beta_{0,0}^+$	max:	329,9 (3)	1,421 (7)
$\beta_{0,0}^+$	avg:	143,1 (1)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Cu)	0,811 — 1,022	1,305 (21)	
XK α_2	(Cu)	8,02792	11,76 (13)	} K α
XK α_1	(Cu)	8,04787	22,91 (22)	}
XK β_1	(Cu)	8,90539	}	K' β_1
XK β_5''	(Cu)	8,9771	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{2,1}(\text{Cu})$	344,95 (20)	0,00254 (18)
γ^\pm	511	2,842 (13)
$\gamma_{1,0}(\text{Cu})$	770,64 (9)	0,00269 (22)
$\gamma_{2,0}(\text{Cu})$	1115,539 (2)	50,22 (11)

6 Main Production Modes

$$\left\{ \begin{array}{l} \text{Zn} - 64(n,\gamma)\text{Zn} - 65 \quad \sigma : 0,76 \text{ (2) barns} \\ \text{Possible impurities : Cu} - 64, \text{ Cu} - 67, \text{ Zn} - 69\text{m} \end{array} \right.$$

$$\left\{ \begin{array}{l} \text{Cu} - 65(p,n)\text{Zn} - 65 \\ \text{Possible impurities : Cu} - 67, \text{ Co} - 60 \end{array} \right.$$

7 References

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