



1 Decay Scheme

Ga-68 disintegrates by positron emission (88.88 (41) %) and electron capture (11.11 (41) %) into Zn-68. Besides the main g(1,0) transition, there are 13 weak gamma transitions from 5 excited levels in Zn-68. *Le gallium 68 se désintègre par émission bêta plus (88,88 (41) %) et par capture électronique (11,11 (41) %) vers le zinc 68.*

2 Nuclear Data

$$T_{1/2}({}^{68}\text{Ga}) : 67,83 \quad (20) \quad \text{min}$$

$$Q^+({}^{68}\text{Ga}) : 2921,1 \quad (12) \quad \text{keV}$$

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>	P_K	P_L	P_M
$\epsilon_{0,5}$	99,3 (12)	0,0104 (5)	Allowed	5,1	0,8653 (18)	0,1141 (17)	0,0192 (5)
$\epsilon_{0,4}$	582,7 (12)	0,096 (3)	Allowed	5,7	0,8823 (16)	0,1000 (15)	0,0166 (5)
$\epsilon_{0,3}$	1037,9 (12)	0,234 (5)	Allowed	5,9	0,8836 (15)	0,0989 (14)	0,0164 (5)
$\epsilon_{0,2}$	1265,2 (12)	0,0335 (23)	Allowed	6,9	0,8839 (15)	0,0986 (14)	0,0163 (5)
$\epsilon_{0,1}$	1843,7 (12)	1,80 (5)	Allowed	5,5	0,8844 (15)	0,0983 (14)	0,0162 (5)
$\epsilon_{0,0}$	2921,1 (12)	8,94 (41)	Allowed	5,2	0,8847 (15)	0,0980 (12)	0,0162 (4)

2.2 β^+ Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>
$\beta_{0,2}^+$	243,2 (12)	0,00026 (2)	Allowed	
$\beta_{0,1}^+$	821,7 (12)	1,20 (4)	Allowed	
$\beta_{0,0}^+$	1899,1 (12)	87,68 (41)	Allowed	

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{3,2}(\text{Zn})$	227,31 (15)	0,00012 (5)	E2	0,0268 (4)	0,00286 (4)	0,000406 (6)	0,0300 (5)
$\gamma_{5,4}(\text{Zn})$	483,35 (16)	0,000265 (29)	M1+50(25)%E2	0,0015 (3)	0,00016 (3)	0,000022 (4)	0,0017 (3)
$\gamma_{2,1}(\text{Zn})$	578,52 (13)	0,0343 (23)	E2	0,001139 (16)	0,0001160 (17)	0,0000166 (3)	0,001272 (18)
$\gamma_{4,2}(\text{Zn})$	682,57 (16)	0,000314 (20)	E2	0,000707 (10)	0,0000716 (10)	0,0000103 (2)	0,000789 (11)
$\gamma_{3,1}(\text{Zn})$	805,84 (8)	0,0928 (27)	M1+70(1)%E2	0,000421 (6)	0,0000424 (7)	0,00000607 (9)	0,000470 (7)
$\gamma_{5,3}(\text{Zn})$	938,62 (20)	0,000178 (16)	M1+33(8)%E2	0,000272 (11)	0,0000272 (11)	0,0000039 (2)	0,000304 (12)
$\gamma_{1,0}(\text{Zn})$	1077,35 (5)	3,236 (30)	E2	0,000221 (4)	0,0000222 (4)	0,00000318 (5)	0,000247 (4)
$\gamma_{5,2}(\text{Zn})$	1165,93 (15)	0,000016 (10)	E2	0,000185 (3)	0,0000185 (3)	0,00000265 (4)	0,000211 (3)
$\gamma_{4,1}(\text{Zn})$	1261,09 (9)	0,0954 (21)	M1+2,2(1)%E2	0,0001418 (20)	0,00001409 (20)	0,00000202 (3)	0,0001725 (25)
$\gamma_{2,0}(\text{Zn})$	1655,87 (14)		E0				
$\gamma_{5,1}(\text{Zn})$	1744,44 (13)	0,0096 (5)	M1+6,9(1)%E2	0,0000770 (11)	0,00000763 (11)	0,00000109 (2)	0,000241 (4)
$\gamma_{3,0}(\text{Zn})$	1883,19 (6)	0,1420 (35)	E2	0,0000697 (10)	0,00000691 (10)	0,00000099 (2)	0,000333 (5)
$\gamma_{4,0}(\text{Zn})$	2338,48 (8)	0,00113 (16)	E2	0,0000471 (7)	0,00000467 (7)	0,00000067 (1)	0,000529 (8)
$\gamma_{5,0}(\text{Zn})$	2821,79 (14)	0,000466 (36)	E2	0,0000343 (5)	0,00000339 (5)	0,000000486 (7)	0,000740 (11)

3 Atomic Data

3.1 Zn

ω_K	:	0,486	(4)
$\bar{\omega}_L$:	0,0108	(4)
n_{KL}	:	1,326	(4)

3.1.1 X Radiations

		Energy keV	Relative probability
X _K	K α_2	8,61587	51,42
	K α_1	8,63896	100
	K β_1	9,5721	}
	K β_5''	9,6499	
X _L	L ℓ	0,884	
	L α	1,012 – 1,012	
	L η	0,906	
	L β	1,02 – 1,186	
	L γ	1,043 – 1,043	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	7,21 – 7,55	100
KLX	8,31 – 8,63	28,3
KXY	9,39 – 9,65	2,01
Auger L	0,732 – 0,997	360

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Zn)	0,732 - 0,997	13,98 (19)
e _{AK}	(Zn)		5,05 (20)
	KLL	7,21 - 7,55	}
	KLX	8,31 - 8,63	}
	KXY	9,39 - 9,65	}
$\beta_{0,0}^+$	max:	1899,1 (12)	87,68 (41)
$\beta_{0,0}^+$	avg:	836,0 (6)	
$\beta_{0,1}^+$	max:	821,7 (12)	1,20 (4)
$\beta_{0,1}^+$	avg:	352,6 (6)	
$\beta_{0,2}^+$	max:	243,2 (12)	0,00026 (2)
$\beta_{0,2}^+$	avg:	107,6 (6)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.
XL	(Zn)	0,884 — 1,186	0,146 (4)
XK α_2	(Zn)	8,61587	1,42 (6) } K α
XK α_1	(Zn)	8,63896	2,76 (11) }
XK β_1	(Zn)	9,5721	0,593 (24) } K' β_1
XK β_5''	(Zn)	9,6499	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{3,2}(\text{Zn})$	227,31 (15)	0,000120 (49)
$\gamma_{5,4}(\text{Zn})$	483,35 (16)	0,000265 (29)
γ^{\pm}	511	177,8 (8)
$\gamma_{2,1}(\text{Zn})$	578,52 (13)	0,0343 (23)
$\gamma_{4,2}(\text{Zn})$	682,57 (16)	0,000314 (20)
$\gamma_{3,1}(\text{Zn})$	805,83 (8)	0,0928 (27)
$\gamma_{5,3}(\text{Zn})$	938,61 (20)	0,000178 (16)
$\gamma_{1,0}(\text{Zn})$	1077,34 (5)	3,235 (30)
$\gamma_{5,2}(\text{Zn})$	1165,92 (15)	0,000016 (10)
$\gamma_{4,1}(\text{Zn})$	1261,08 (9)	0,0954 (21)
$\gamma_{5,1}(\text{Zn})$	1744,42 (13)	0,0096 (5)
$\gamma_{3,0}(\text{Zn})$	1883,16 (6)	0,1420 (35)
$\gamma_{4,0}(\text{Zn})$	2338,44 (8)	0,00113 (16)
$\gamma_{5,0}(\text{Zn})$	2821,73 (14)	0,000466 (36)

6 Main Production Modes

- Cu – 65(α ,n)Ga – 68
- Zn – 67(p, γ)Ga – 68
- Zn – 68(p,n)Ga – 68
- Ga – 69(d,t)Ga – 68
- Ge – 70(d, α)Ga – 68
- { Ge – 68(E.C.)Ga – 68
- { Chemical separation after EC decay

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