$^{68}_{31}$Ga $_{37}$

1 Decay Scheme

Ga-68 disintegrates by positron emission (89.14 %) and electron capture (10.86 %) into Zn-68. Besides the main gamma transition g(1,0) there are 13 weak gamma transitions from 5 excited levels in Zn-68.
Le Ga-68 se désintègre par émission bêta plus (89,14 %) et par capture électronique (10,86 %) vers le Zn-68.

2 Nuclear Data

$T_{1/2}$(^{68}Ga)	:	1,1285	(10)	h
Q^+(^{68}Ga)	:	2921,1	(12)	keV

2.1 β^+ Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^+_{0,2}$	243,2 (12)	0,00026 (3)	Allowed	
$\beta^+_{0,1}$	821,7 (12)	1,20 (3)	Allowed	
$\beta^+_{0,0}$	1899,1 (12)	87,94 (12)	Allowed	

2.2 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg ft	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)	0,095 (3)	Allowed	5,7	0,8823 (16)	0,1000 (15)	0,0166 (5)
$\epsilon_{0,3}$	1037,9 (12)	0,231 (5)	Allowed	5,9	0,8836 (15)	0,0989 (14)	0,0164 (5)
$\epsilon_{0,2}$	1265,2 (12)	0,0331 (17)	Allowed	6,9	0,8839 (15)	0,0986 (14)	0,0163 (5)
$\epsilon_{0,1}$	1843,7 (12)	1,79 (4)	Allowed	5,5	0,8844 (15)	0,0983 (14)	0,0162 (5)
$\epsilon_{0,0}$	2921,1 (12)	8,71 (12)	Allowed	5,2	0,8847 (15)	0,0980 (14)	0,0162 (5)

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_T
$\gamma_{3,2}$(Zn)	227,31 (15)	0,00012 (5)	E2	0,0268 (8)	0,00288 (9)	0,0295 (9)
$\gamma_{5,4}$(Zn)	483,35 (16)	0,00026 (3)	M1+50%E2	0,0016 (2)	0,00016 (2)	0,0017 (2)
$\gamma_{2,1}$(Zn)	578,52 (13)	0,0335 (17)	E2	0,00115 (4)	0,000117 (4)	0,00129 (5)
$\gamma_{4,2}$(Zn)	682,57 (16)	0,000312 (19)	E2	0,000715 (22)	0,0000729 (22)	0,000803 (25)
$\gamma_{3,1}$(Zn)	805,84 (8)	0,094 (3)	M1+70,3%E2	0,000423 (17)	0,000043 (17)	0,00047 (2)
$\gamma_{5,3}$(Zn)	938,62 (20)	0,000177 (17)	M1+33%E2	0,000275 (9)	0,0000277 (9)	0,000304 (9)
$\gamma_{1,0}$(Zn)	1077,35 (5)	3,22 (3)	E2	0,000224 (7)	0,0000224 (7)	0,000248 (8)
$\gamma_{5,2}$(Zn)	1165,93 (15)	0,000016 (10)	E2	0,000185 (6)	0,0000192 (6)	0,000209 (7)
$\gamma_{4,1}$(Zn)	1261,09 (9)	0,094 (3)	M1+2,2%E2	0,000144 (6)	0,0000143 (6)	0,000160 (8)
$\gamma_{2,0}$(Zn)	1655,87 (14)		E0			
$\gamma_{5,1}$(Zn)	1744,44 (13)	0,0095 (5)	M1+6,9%E2	0,000078 (3)	0,0000077 (3)	0,000086 (4)
$\gamma_{3,0}$(Zn)	1883,19 (6)	0,137 (4)	E2	0,000073 (3)	0,0000074 (3)	0,000084 (4)
$\gamma_{4,0}$(Zn)	2338,48 (8)	0,00113 (15)	E2	0,000047 (2)	0,000005 (2)	0,000057 (3)
$\gamma_{5,0}$(Zn)	2821,79 (14)	0,00047 (40)	E2	0,000034 (2)	0,0000038 (2)	0,000044 (3)

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				
	$K\alpha_2$	8,61587		51,42
	$K\alpha_1$	8,63896		100
	$K\beta_3$	9,57208	}	
	$K\beta_5''$	9,6499	}	21,46
	$K\beta_2$	9,65806	}	
X_L				
	$L\ell$	0,884		
	$L\gamma$	– 1,107		

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		13,66 (16)
e_{AK}	(Zn)			4,94 (7)
	KLL	7,21 - 7,55	}	
	KLX	8,31 - 8,63	}	
	KXY	9,39 - 9,65	}	
$ec_{2,1\ K}$	(Zn)	568,86 (13)		0,0000385 (23)
$ec_{2,1\ L}$	(Zn)	577,33 - 577,50		0,00000392 (24)
$ec_{3,1\ K}$	(Zn)	796,17 (7)		0,0000397 (15)
$ec_{3,1\ L}$	(Zn)	804,64 - 804,81		0,0000040 (3)
$ec_{1,0\ K}$	(Zn)	1067,68 (5)		0,000721 (24)
$ec_{1,0\ L}$	(Zn)	1076,15 - 1076,32		0,0000721 (24)
$ec_{3,0\ K}$	(Zn)	1873,50 (6)		0,0000100 (6)
$ec_{3,0\ L}$	(Zn)	1881,07 - 1882,14		0,00000101 (7)
$\beta^+_{0,0}$	max:	1899,1 (12)		87,94 (12)
$\beta^+_{0,0}$	avg:	836,0 (6)		
$\beta^+_{0,1}$	max:	821,7 (12)		1,20 (3)
$\beta^+_{0,1}$	avg:	352,6 (6)		
$\beta^+_{0,2}$	max:	243,2 (12)		0,00026 (3)
$\beta^+_{0,2}$	avg:	107,6 (6)		

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Zn)	0,884 — 1,107		0,149 (6)	
XKα_2	(Zn)	8,61587		1,389 (7)	} Kα
XKα_1	(Zn)	8,63896		2,701 (24)	}
XKβ_3	(Zn)	9,57208	}		
XKβ_1	(Zn)		}	0,579 (10)	K$'\beta_1$
XKβ_5''	(Zn)	9,6499	}		
XKβ_2	(Zn)	9,65806	}		
XKβ_4	(Zn)		}		Kβ_2'

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{3,2}$(Zn)	227,31 (15)	0,00012 (5)
$\gamma_{5,4}$(Zn)	483,35 (16)	0,00026 (3)
$\gamma^{\pm}$	511	178,28 (22)
$\gamma_{2,1}$(Zn)	578,52 (13)	0,0335 (17)
$\gamma_{4,2}$(Zn)	682,57 (16)	0,000312 (19)
$\gamma_{3,1}$(Zn)	805,83 (8)	0,094 (3)
$\gamma_{5,3}$(Zn)	938,61 (20)	0,000177 (17)
$\gamma_{1,0}$(Zn)	1077,34 (5)	3,22 (3)
$\gamma_{5,2}$(Zn)	1165,92 (15)	0,000016 (10)
$\gamma_{4,1}$(Zn)	1261,08 (9)	0,094 (3)
$\gamma_{5,1}$(Zn)	1744,42 (13)	0,0095 (5)
$\gamma_{3,0}$(Zn)	1883,16 (6)	0,137 (4)
$\gamma_{4,0}$(Zn)	2338,44 (8)	0,00113 (15)
$\gamma_{5,0}$(Zn)	2821,73 (14)	0,00047 (40)

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(EC)Ga – 68
{ Chemical separation of Ga-68 from the parent nuclide after EC decay.

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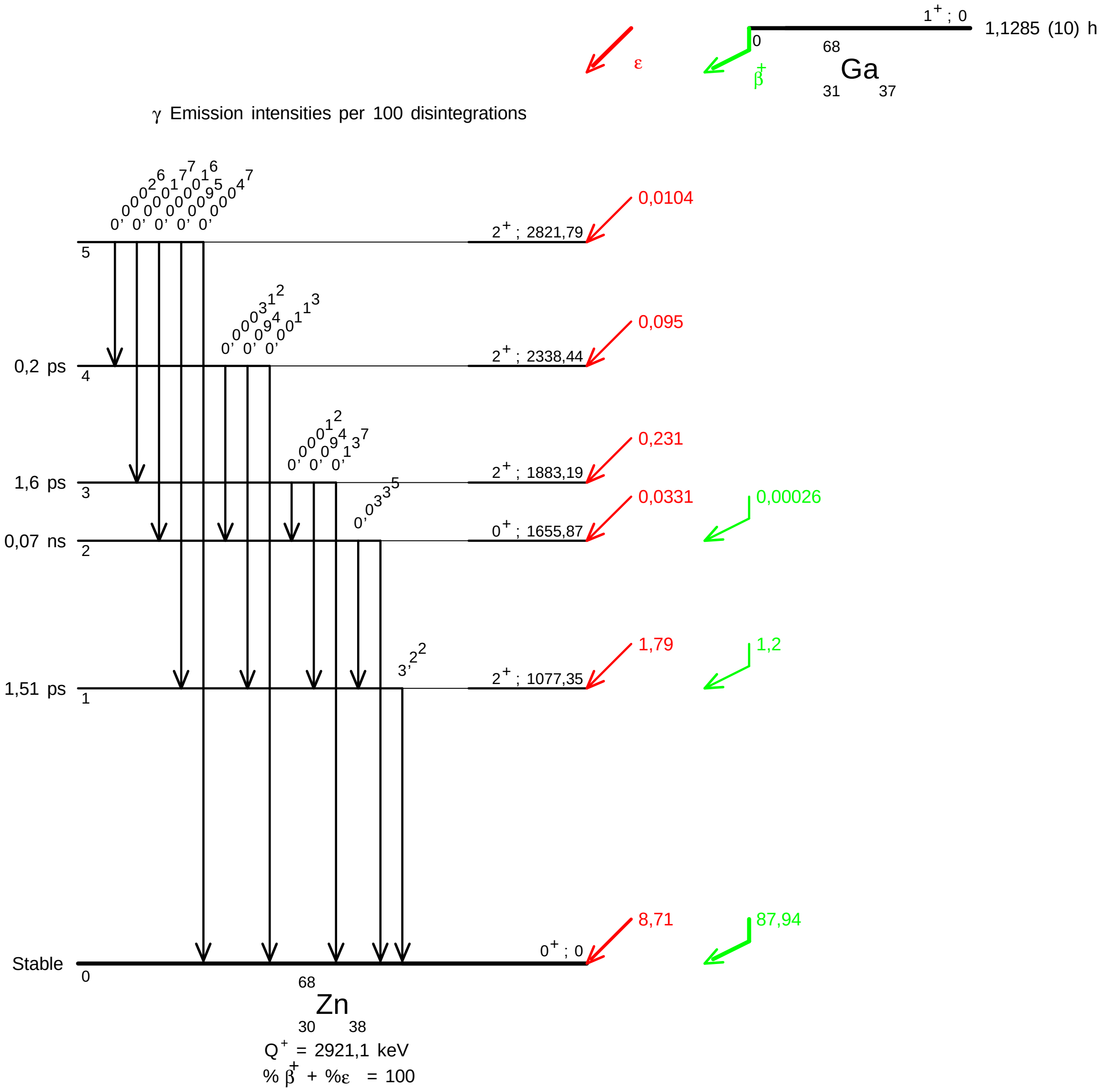
1+ ; 0
1,1285 (10) h
68
Ga
31 37
ε
β+
γ Emission intensities per 100 disintegrations
0,0104
2+ ; 2821,79
0,095
2+ ; 2338,44
0,231
2+ ; 1883,19
0,0331
0,00026
0+ ; 1655,87
1,79
1,2
2+ ; 1077,35
8,71
87,94
0+ ; 0
0,2 ps
1,6 ps
0,07 ns
1,51 ps
Stable
68
Zn
30 38
Q+ = 2921,1 keV
% β+ + %ε = 100