$$^{211}_{82}\mathrm{Pb}_{129}$$

1 Decay Scheme

Pb-211 ground state ($J^\pi = 9/2^+$) decays by 100 % beta minus to Bi-211. The strongest branch (91.28 (12) %) decays directly to the ground state ($J^\pi = 9/2^-$).

Le plomb 211 se désintègre par émissions bêta principalement vers le niveau fondamental du bismuth 211.

2 Nuclear Data

$T_{1/2}(^{211}\mathrm{Pb}\ )$: 36,1 (2) min
$Q^-(^{211}\mathrm{Pb}\ )$: 1367 (6) keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,10}$	96 (6)	0,0172 (15)	1st forbidden non-unique	5,93
$\beta^-_{0,9}$	133 (6)	0,0009 (3)		
$\beta^-_{0,8}$	171 (6)	0,019 (4)		
$\beta^-_{0,7}$	257 (6)	1,06 (4)	1st forbidden non-unique	5,58
$\beta^-_{0,6}$	263 (6)	0,0047 (7)		
$\beta^-_{0,5}$	286 (6)	0,0570 (24)		
$\beta^-_{0,3}$	535 (6)	6,32 (9)	1st forbidden non-unique	5,73
$\beta^-_{0,2}$	600 (6)	< 0,09	1st forbidden non-unique	> 7,7
$\beta^-_{0,1}$	962 (6)	1,57 (9)	1st forbidden non-unique	7,21
$\beta^-_{0,0}$	1367 (6)	91,28 (12)	1st forbidden non-unique	5,99

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{3,2}$(Bi)	65,304 (18)	0,59 (3)	M1		5,05 (7)	1,188 (17)	6,61 (10)
$\gamma_{7,4}$(Bi)	95,13 (5)	0,19 (3)	M1 + 74,3% E2	2,8 (9)	4,8 (5)	1,27 (12)	9,3 (4)
$\gamma_{5,2}$(Bi)	313,96 (4)	0,0268 (21)					
$\gamma_{7,2}$(Bi)	342,83 (3)	0,035 (6)	[M1,E2]	0,16 (11)	0,035 (11)	0,0085 (22)	0,20 (12)
$\gamma_{2,1}$(Bi)	361,846 (16)	0,049 (6)	[M1,E2]	0,14 (10)	0,03 (1)	0,0072 (20)	0,17 (11)
$\gamma_{1,0}$(Bi)	404,834 (9)	4,30 (7)	M1 + 54,8% E2	0,095 (7)	0,0206 (8)	0,00499 (17)	0,122 (8)
$\gamma_{3,1}$(Bi)	427,150 (15)	2,13 (5)	M1 + 0,05% E2	0,1457 (21)	0,0249 (4)	0,00585 (9)	0,1783 (25)
$\gamma_{8,2}$(Bi)	429,65 (6)	0,008 (3)					
$\gamma_{10,2}$(Bi)	504,07 (6)	0,0059 (8)					
$\gamma_{4,1}$(Bi)	609,55 (4)	0,033 (9)					
$\gamma_{5,1}$(Bi)	675,81 (4)	0,0181 (9)					
$\gamma_{7,1}$(Bi)	704,675 (25)	0,492 (10)	M1 + 0,05% E2	0,0390 (6)	0,00657 (10)	0,001540 (22)	0,0476 (7)
$\gamma_{2,0}$(Bi)	766,680 (13)	0,64 (4)	M1	0,0313 (5)	0,00527 (8)	0,001234 (18)	0,0382 (6)
$\gamma_{3,0}$(Bi)	831,984 (12)	3,60 (5)	M1 + 13,8% E2	0,0229 (23)	0,0039 (4)	0,00092 (8)	0,028 (3)
$\gamma_{10,1}$(Bi)	865,92 (6)	0,0046 (2)					
$\gamma_{4,0}$(Bi)	1014,38 (4)	0,0173 (5)					
$\gamma_{5,0}$(Bi)	1080,64 (4)	0,0121 (5)					
$\gamma_{6,0}$(Bi)	1103,52 (20)	0,0047 (7)					
$\gamma_{7,0}$(Bi)	1109,509 (23)	0,118 (3)	[M1]	0,01209 (17)	0,00201 (3)	0,000470 (7)	0,01472 (21)
$\gamma_{8,0}$(Bi)	1196,33 (5)	0,0103 (4)					
$\gamma_{9,0}$(Bi)	1234,3 (4)	0,0009 (3)					
$\gamma_{10,0}$(Bi)	1270,75 (6)	0,0068 (12)					

3 Atomic Data

3.1 Bi

ω_K : 0,964 (4)
$\bar{\omega}_L$: 0,391 (16)
n_{KL} : 0,809 (5)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	74,8157		59,77
	$K\alpha_1$	77,1088		100
	$K\beta_3$	86,835	}	
	$K\beta_1$	87,344	}	
	$K\beta''_5$	87,862	}	34,3
	$K\beta_2$	89,732	}	
	$K\beta_4$	90,074	}	10,5
	$KO_{2,3}$	90,421	}	

		Energy keV	Relative probability
X_L			
	Lℓ	9,4207	
	Lα	10,7308 – 10,8387	
	Lη	11,7127	
	Lβ	12,4814 – 13,8066	
	Lγ	14,7735 – 15,7084	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	57,491 – 63,419	100
KLX	70,025 – 77,105	56
KXY	82,53 – 90,52	7,84
Auger L	5,42 – 16,34	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Bi)	5,42 - 16,34	0,782 (18)
e_{AK}	(Bi)		0,029 (4)
	KLL	57,491 - 63,419 }	
	KLX	70,025 - 77,105 }	
	KXY	82,53 - 90,52 }	
$ec_{3,2\ L}$	(Bi)	48,916 - 51,885	0,389 (21)
$ec_{1,0\ K}$	(Bi)	314,308 (9)	0,36 (3)
$ec_{3,1\ K}$	(Bi)	336,624 (15)	0,264 (7)
$\beta^-_{0,10}$	max:	96 (6)	0,0172 (15)
$\beta^-_{0,10}$	avg:	25,0 (17)	
$\beta^-_{0,9}$	max:	133 (6)	0,0009 (3)
$\beta^-_{0,9}$	avg:	35,0 (17)	
$\beta^-_{0,8}$	max:	171 (6)	0,019 (4)

		Energy keV		Electrons per 100 disint.
$\beta^-_{0,8}$	avg:	45,6	(18)	
$\beta^-_{0,7}$	max:	257	(6)	1,06 (4)
$\beta^-_{0,7}$	avg:	71,0	(18)	
$\beta^-_{0,6}$	max:	263	(6)	0,0047 (7)
$\beta^-_{0,6}$	avg:	72,8	(18)	
$\beta^-_{0,5}$	max:	286	(6)	0,0570 (24)
$\beta^-_{0,5}$	avg:	79,7	(19)	
$\beta^-_{0,3}$	max:	535	(6)	6,32 (9)
$\beta^-_{0,3}$	avg:	159,8	(21)	
$\beta^-_{0,2}$	max:	600	(6)	< 0,09
$\beta^-_{0,2}$	avg:	182,2	(21)	
$\beta^-_{0,1}$	max:	962	(6)	1,57 (9)
$\beta^-_{0,1}$	avg:	313,3	(23)	
$\beta^-_{0,0}$	max:	1367	(6)	91,28 (12)
$\beta^-_{0,0}$	avg:	470,9	(24)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Bi)	9,4207 — 15,7084		0,494 (13)	
XKα_2	(Bi)	74,8157		0,228 (10)	} Kα
XKα_1	(Bi)	77,1088		0,381 (17)	}
XKβ_3	(Bi)	86,835	}		
XKβ_1	(Bi)	87,344	}	0,130 (6)	K$'\beta_1$
XKβ''_5	(Bi)	87,862	}		
XKβ_2	(Bi)	89,732	}		
XKβ_4	(Bi)	90,074	}	0,0399 (20)	K$'\beta_2$
XKO$_{2,3}$	(Bi)	90,421	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{3,2}$(Bi)	65,304 (18)	0,077 (4)
$\gamma_{7,4}$(Bi)	95,13 (5)	0,018 (3)
$\gamma_{5,2}$(Bi)	313,96 (4)	0,0268 (21)
$\gamma_{7,2}$(Bi)	342,83 (3)	0,029 (4)
$\gamma_{2,1}$(Bi)	361,846 (16)	0,042 (3)
$\gamma_{1,0}$(Bi)	404,834 (9)	3,83 (6)
$\gamma_{3,1}$(Bi)	427,150 (15)	1,81 (4)
$\gamma_{8,2}$(Bi)	429,65 (6)	0,008 (3)
$\gamma_{10,2}$(Bi)	504,07 (6)	0,0059 (8)
$\gamma_{4,1}$(Bi)	609,55 (4)	0,033 (9)
$\gamma_{5,1}$(Bi)	675,81 (4)	0,0181 (9)
$\gamma_{7,1}$(Bi)	704,675 (25)	0,47 (1)
$\gamma_{2,0}$(Bi)	766,680 (13)	0,62 (4)
$\gamma_{3,0}$(Bi)	831,984 (12)	3,50 (5)
$\gamma_{10,1}$(Bi)	865,92 (6)	0,0046 (2)
$\gamma_{4,0}$(Bi)	1014,38 (4)	0,0173 (5)
$\gamma_{5,0}$(Bi)	1080,64 (4)	0,0121 (5)
$\gamma_{6,0}$(Bi)	1103,52 (20)	0,0047 (7)
$\gamma_{7,0}$(Bi)	1109,509 (23)	0,116 (3)
$\gamma_{8,0}$(Bi)	1196,33 (5)	0,0103 (4)
$\gamma_{9,0}$(Bi)	1234,3 (4)	0,0009 (3)
$\gamma_{10,0}$(Bi)	1270,75 (6)	0,0068 (12)

6 Main Production Modes

$\mathrm{Po} - 215(\alpha)\mathrm{Pb} - 211$

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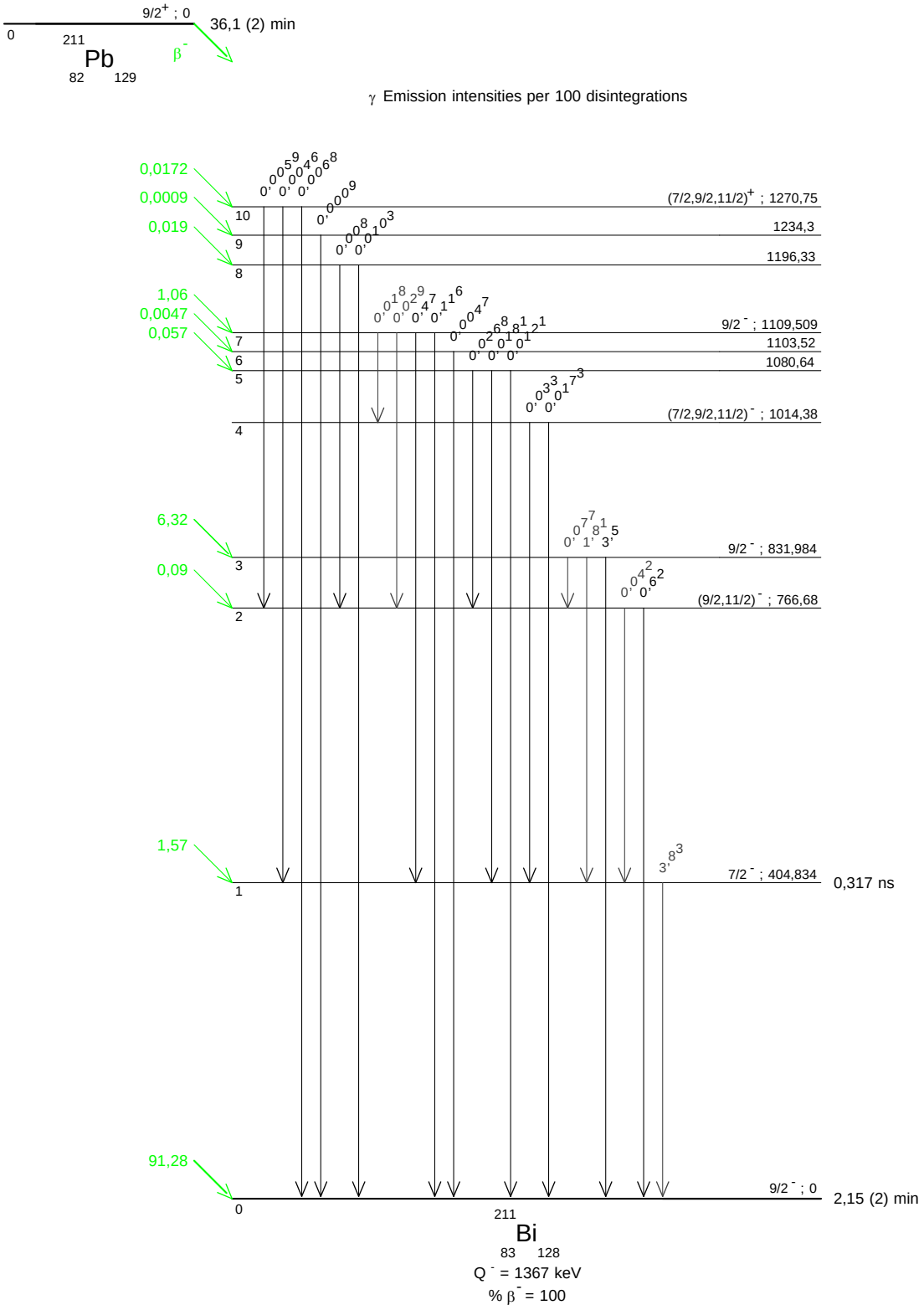
9/2+ ; 0
36,1 (2) min
0
211
Pb
82 129
β-
γ Emission intensities per 100 disintegrations
0,0172
0,0009
0,019
1,06
0,0047
0,057
6,32
0,09
1,57
91,28
10
9
8
7
6
5
4
3
2
1
0
(7/2,9/2,11/2)+ ; 1270,75
1234,3
1196,33
9/2- ; 1109,509
1103,52
1080,64
(7/2,9/2,11/2)- ; 1014,38
9/2- ; 831,984
(9/2,11/2)- ; 766,68
7/2- ; 404,834
0,317 ns
9/2- ; 0
2,15 (2) min
211
Bi
83 128
Q- = 1367 keV
% β- = 100