$^{208}_{81}\mathrm{Tl}_{127}$

1 Decay Scheme

Tl-208 decays by beta minus emission to the Pb-208 excited levels.
Le thallium 208 se désintègre par émission bêta moins vers les niveaux excités du plomb 208.

2 Nuclear Data

$T_{1/2}(^{208}\mathrm{Tl})$	:	3,060	(8)	min
$Q^{-}(^{208}\mathrm{Tl})$	:	5001	(2)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,18}$	521 (2)	0,053 (5)	1st Forbidden	6,67
$\beta^-_{0,17}$	618 (2)	0,017 (5)	1st Forbidden	7,4
$\beta^-_{0,16}$	643 (2)	0,045 (7)	1st Forbidden	7,05
$\beta^-_{0,15}$	678 (2)	0,005 (2)	1st Forbidden	8,1
$\beta^-_{0,14}$	690 (2)	0,076 (11)	1st Forbidden	6,93
$\beta^-_{0,13}$	705 (2)	0,048 (6)	1st Forbidden	7,16
$\beta^-_{0,12}$	718 (2)	0,030 (7)	1st Forbidden	7,4
$\beta^-_{0,11}$	739 (2)	0,002 (1)	1st Forbidden	8,6
$\beta^-_{0,10}$	821 (2)	0,231 (9)	1st Forbidden	6,71
$\beta^-_{0,9}$	876 (2)	0,18 (2)	1st Forbidden	6,91
$\beta^-_{0,8}$	1005 (3)	0,007 (3)	1st Forbidden	8,5
$\beta^-_{0,7}$	1040 (2)	3,26 (7)	1st Forbidden	5,92
$\beta^-_{0,6}$	1055 (2)	0,048 (3)	1st Forbidden	7,77
$\beta^-_{0,5}$	1081 (2)	0,64 (6)	1st Forbidden	6,69
$\beta^-_{0,4}$	1293 (2)	24,1 (3)	1st Forbidden	5,39
$\beta^-_{0,3}$	1526 (2)	22,2 (7)	1st Forbidden	5,69
$\beta^-_{0,2}$	1803 (2)	49,0 (9)	1st Forbidden	5,62

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M+	α_T
$\gamma_{5,4}$(Pb)	211,4 (2)	0,39 (2)	[M1+2%E2]	0,952 (29)	0,166 (5)	0,052 (2)	1,17 (4)
$\gamma_{4,3}$(Pb)	233,3 (1)	0,59 (2)	[M1+2%E2]	0,724 (22)	0,125 (4)	0,039 (1)	0,888 (27)
$\gamma_{7,4}$(Pb)	252,5 (2)	1,34 (4)	[M1+2%E2]	0,582 (17)	0,100 (3)	0,0310 (9)	0,713 (21)
$\gamma_{3,2}$(Pb)	277,37 (3)	10,3 (5)	[M1]	0,457 (14)	0,078 (2)	0,0240 (7)	0,559 (17)
$\gamma_{7,3}$(Pb)	485,8 (1)	0,055 (4)	[M1]	0,101 (3)	0,0170 (5)	0,0050 (2)	0,123 (4)
$\gamma_{4,2}$(Pb)	510,7 (1)	25,0 (2)	[M1+0,27%E2]	0,089 (3)	0,0156 (5)	0,0040 (1)	0,108 (3)
$\gamma_{2,1}$(Pb)	583,187 (2)	86,8 (1)	E2	0,0152 (5)	0,0042 (1)	0,00130 (4)	0,0207 (6)
$\gamma_{13,4}$(Pb)	587,8 (2)	0,060 (21)	[M1]	0,0614 (18)	0,0102 (3)	0,0032 (1)	0,0748 (22)
$\gamma_{9,3}$(Pb)	650,2 (2)	0,05 (2)	[M1]	0,0472 (14)	0,0078 (2)	0,00250 (8)	0,0575 (17)
$\gamma_{10,3}$(Pb)	705,3 (2)	0,023 (4)	[M1]	0,0382 (11)	0,0063 (2)	0,00200 (6)	0,0465 (14)
$\gamma_{5,2}$(Pb)	722,0 (1)	0,25 (4)	[M1+8,8%E2]	0,0337 (10)	0,0056 (2)	0,00180 (5)	0,0411 (10)
$\gamma_{6,2}$(Pb)	748,7 (2)	0,0480 (31)	[M1]	0,0328 (10)	0,0054 (2)	0,00170 (5)	0,0399 (12)
$\gamma_{7,2}$(Pb)	763,2 (1)	1,86 (3)	[M1+0,01%E2]	0,0312 (10)	0,0052 (2)	0,00150 (5)	0,0379 (11)
$\gamma_{12,3}$(Pb)	808,3 (2)	0,030 (7)					
$\gamma_{13,3}$(Pb)	821,1 (2)	0,042 (4)	[M1]	0,0258 (8)	0,0043 (1)	0,00130 (4)	0,0314 (9)
$\gamma_{14,3}$(Pb)	835,9 (2)	0,076 (11)					
$\gamma_{3,1}$(Pb)	860,56 (3)	12,8 (1)	[M1+33,5%E2]	0,0176 (5)	0,0030 (1)	0,00100 (3)	0,0216 (6)
$\gamma_{16,3}$(Pb)	883,4 (2)	0,032 (3)	[M1]	0,0214 (7)	0,0035 (1)	0,00120 (4)	0,0261 (8)
$\gamma_{9,2}$(Pb)	927,6 (2)	0,128 (1)	[M1]	0,0189 (6)	0,0031 (1)	0,00100 (3)	0,0230 (7)
$\gamma_{10,2}$(Pb)	982,7 (2)	0,209 (8)	[M1]	0,0163 (5)	0,00270 (8)	0,00080 (2)	0,0198 (6)
$\gamma_{4,1}$(Pb)	1093,9 (1)	0,43 (2)	E2	0,00455 (14)	0,00084 (3)	0,000270 (8)	0,00566 (17)
$\gamma_{15,2}$(Pb)	1125,7 (4)	0,005 (2)					
$\gamma_{16,2}$(Pb)	1160,8 (2)	0,011 (3)	[M1]	0,0107 (3)	0,00160 (5)	0,00060 (2)	0,0129 (4)
$\gamma_{17,2}$(Pb)	1185,2 (3)	0,017 (5)	[M1]	0,0101 (3)	0,00160 (5)	0,00060 (2)	0,0123 (4)
$\gamma_{18,2}$(Pb)	1282,8 (3)	0,053 (5)	[M1]	0,00830 (25)	0,00127 (4)	0,00049 (2)	0,01006 (30)
$\gamma_{8,1}$(Pb)	1381,1 (5)	0,007 (3)	[E2]	0,00297 (9)	0,00051 (2)	0,000160 (5)	0,00364 (11)
$\gamma_{11,1}$(Pb)	1647,5 (7)	0,002 (1)					
$\gamma_{16,1}$(Pb)	1743,9 (2)	0,002 (1)	[M1]	0,00382 (11)	0,00057 (2)	0,000160 (5)	0,00455 (14)
$\gamma_{1,0}$(Pb)	2614,511 (10)	100,00 (1)	E3	0,00173 (5)	0,000290 (9)	0,000080 (2)	0,00210 (6)

3 Atomic Data

3.1 Pb

ω_K : 0,963 (4)
$\bar{\omega}_L$: 0,379 (15)
n_{KL} : 0,811 (5)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	72,8049		59,6
	$K\alpha_1$	74,97		100
	$K\beta_3$	84,451	}	
	$K\beta_1$	84,937	}	
	$K\beta_5''$	85,47	}	34,1

		Energy keV		Relative probability
	$K\beta_2$	87,238	}	
	$K\beta_4$	87,58	}	10,3
	$KO_{2,3}$	87,911	}	
X_L				
	$L\ell$	9,184		
	$L\alpha$	10,45 – 10,551		
	$L\eta$	11,349		
	$L\beta$	12,142 – 13,015		
	$L\gamma$	14,765 – 15,216		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	56,03 – 61,67	100
KLX	68,18 – 74,97	56
KXY	80,3 – 88,0	7,8
Auger L	5,26 – 10,40	3020

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e_{AL}	(Pb)	5,26 - 10,40		5,23 (9)
e_{AK}	(Pb)			0,28 (4)
	KLL	56,03 - 61,67	}	
	KLX	68,18 - 74,97	}	
	KXY	80,3 - 88,0	}	
$ec_{3,2\ K}$	(Pb)	189,37 (3)		3,01 (9)
$ec_{3,2\ L}$	(Pb)	261,51 - 264,33		0,51 (2)
$ec_{3,2\ M}$	(Pb)	273,52 - 277,23		0,16 (1)
$ec_{4,2\ K}$	(Pb)	422,7 (1)		2,0 (1)
$ec_{4,2\ L}$	(Pb)	494,8 - 497,7		0,3
$ec_{2,1\ K}$	(Pb)	495,19 (3)		1,3 (1)
$ec_{4,2\ M}$	(Pb)	506,8 - 510,6		0,09
$ec_{2,1\ L}$	(Pb)	567,33 - 570,15		0,4
$ec_{2,1\ M}$	(Pb)	579,34 - 583,05		0,1

		Energy keV		Electrons per 100 disint.
$\beta^-_{0,18}$	max:	521	(2)	0,053 (5)
$\beta^-_{0,18}$	avg:	155,1	(7)	
$\beta^-_{0,17}$	max:	618	(2)	0,017 (5)
$\beta^-_{0,17}$	avg:	188,6	(7)	
$\beta^-_{0,16}$	max:	643	(2)	0,045 (7)
$\beta^-_{0,16}$	avg:	197,1	(7)	
$\beta^-_{0,15}$	max:	678	(2)	0,005 (2)
$\beta^-_{0,15}$	avg:	209,5	(7)	
$\beta^-_{0,14}$	max:	690	(2)	0,076 (11)
$\beta^-_{0,14}$	avg:	213,9	(7)	
$\beta^-_{0,13}$	max:	705	(2)	0,048 (6)
$\beta^-_{0,13}$	avg:	219,2	(7)	
$\beta^-_{0,12}$	max:	718	(2)	0,030 (7)
$\beta^-_{0,12}$	avg:	223,8	(7)	
$\beta^-_{0,11}$	max:	739	(2)	0,002 (1)
$\beta^-_{0,11}$	avg:	231,4	(8)	
$\beta^-_{0,10}$	max:	821	(2)	0,231 (9)
$\beta^-_{0,10}$	avg:	261,2	(7)	
$\beta^-_{0,9}$	max:	876	(2)	0,18 (2)
$\beta^-_{0,9}$	avg:	281,5	(7)	
$\beta^-_{0,8}$	max:	1005	(3)	0,007 (3)
$\beta^-_{0,8}$	avg:	330,4	(8)	
$\beta^-_{0,7}$	max:	1040	(2)	3,26 (7)
$\beta^-_{0,7}$	avg:	343,6	(8)	
$\beta^-_{0,6}$	max:	1055	(2)	0,048 (3)
$\beta^-_{0,6}$	avg:	349,2	(8)	
$\beta^-_{0,5}$	max:	1081	(2)	0,64 (6)
$\beta^-_{0,5}$	avg:	359,5	(8)	
$\beta^-_{0,4}$	max:	1293	(2)	24,1 (3)
$\beta^-_{0,4}$	avg:	442,3	(8)	
$\beta^-_{0,3}$	max:	1526	(2)	22,2 (7)
$\beta^-_{0,3}$	avg:	536,2	(8)	
$\beta^-_{0,2}$	max:	1803	(2)	49,0 (9)
$\beta^-_{0,2}$	avg:	650,3	(8)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Pb)	9,184 — 15,216		2,89 (6)	
$XK\alpha_2$	(Pb)	72,8049		2,15 (6)	} $K\alpha$
$XK\alpha_1$	(Pb)	74,97		3,61 (9)	}
$XK\beta_3$	(Pb)	84,451	}		
$XK\beta_1$	(Pb)	84,937	}	1,23 (4)	$K'\beta_1$
$XK\beta_5''$	(Pb)	85,47	}		
$XK\beta_2$	(Pb)	87,238	}		
$XK\beta_4$	(Pb)	87,58	}	0,373 (13)	$K'\beta_2$
$XKO_{2,3}$	(Pb)	87,911	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{5,4}$(Pb)	211,4 (2)	0,18 (1)
$\gamma_{4,3}$(Pb)	233,3 (1)	0,31 (1)
$\gamma_{7,4}$(Pb)	252,5 (2)	0,78 (2)
$\gamma_{3,2}$(Pb)	277,37 (3)	6,6 (3)
$\gamma_{7,3}$(Pb)	485,8 (1)	0,049 (4)
$\gamma_{4,2}$(Pb)	510,7 (1)	22,6 (2)
$\gamma_{2,1}$(Pb)	583,187 (2)	85,0 (3)
$\gamma_{13,4}$(Pb)	587,8 (2)	0,06 (2)
$\gamma_{9,3}$(Pb)	650,2 (2)	0,05 (2)
$\gamma_{10,3}$(Pb)	705,3 (2)	0,022 (4)
$\gamma_{5,2}$(Pb)	722,0 (1)	0,24 (4)
$\gamma_{6,2}$(Pb)	748,7 (2)	0,046 (3)
$\gamma_{7,2}$(Pb)	763,2 (1)	1,79 (3)
$\gamma_{12,3}$(Pb)	808,3 (2)	0,030 (7)
$\gamma_{13,3}$(Pb)	821,1 (2)	0,041 (4)
$\gamma_{14,3}$(Pb)	835,9 (2)	0,076 (11)
$\gamma_{3,1}$(Pb)	860,56 (3)	12,5 (1)
$\gamma_{16,3}$(Pb)	883,4 (2)	0,031 (3)
$\gamma_{9,2}$(Pb)	927,6 (2)	0,125 (1)
$\gamma_{10,2}$(Pb)	982,7 (2)	0,205 (8)
$\gamma_{4,1}$(Pb)	1093,9 (1)	0,43 (2)
$\gamma_{15,2}$(Pb)	1125,7 (4)	0,005 (2)
$\gamma_{16,2}$(Pb)	1160,8 (2)	0,011 (3)
$\gamma_{17,2}$(Pb)	1185,2 (3)	0,017 (5)
$\gamma_{18,2}$(Pb)	1282,8 (3)	0,052 (5)

	Energy keV	Photons per 100 disint.
$\gamma_{8,1}$(Pb)	1381,1 (5)	0,007 (3)
$\gamma_{11,1}$(Pb)	1647,5 (7)	0,002 (1)
$\gamma_{16,1}$(Pb)	1743,9 (2)	0,002 (1)
$\gamma_{1,0}$(Pb)	2614,511 (10)	99,79 (1)

6 Main Production Modes

Bi – 212 α decay

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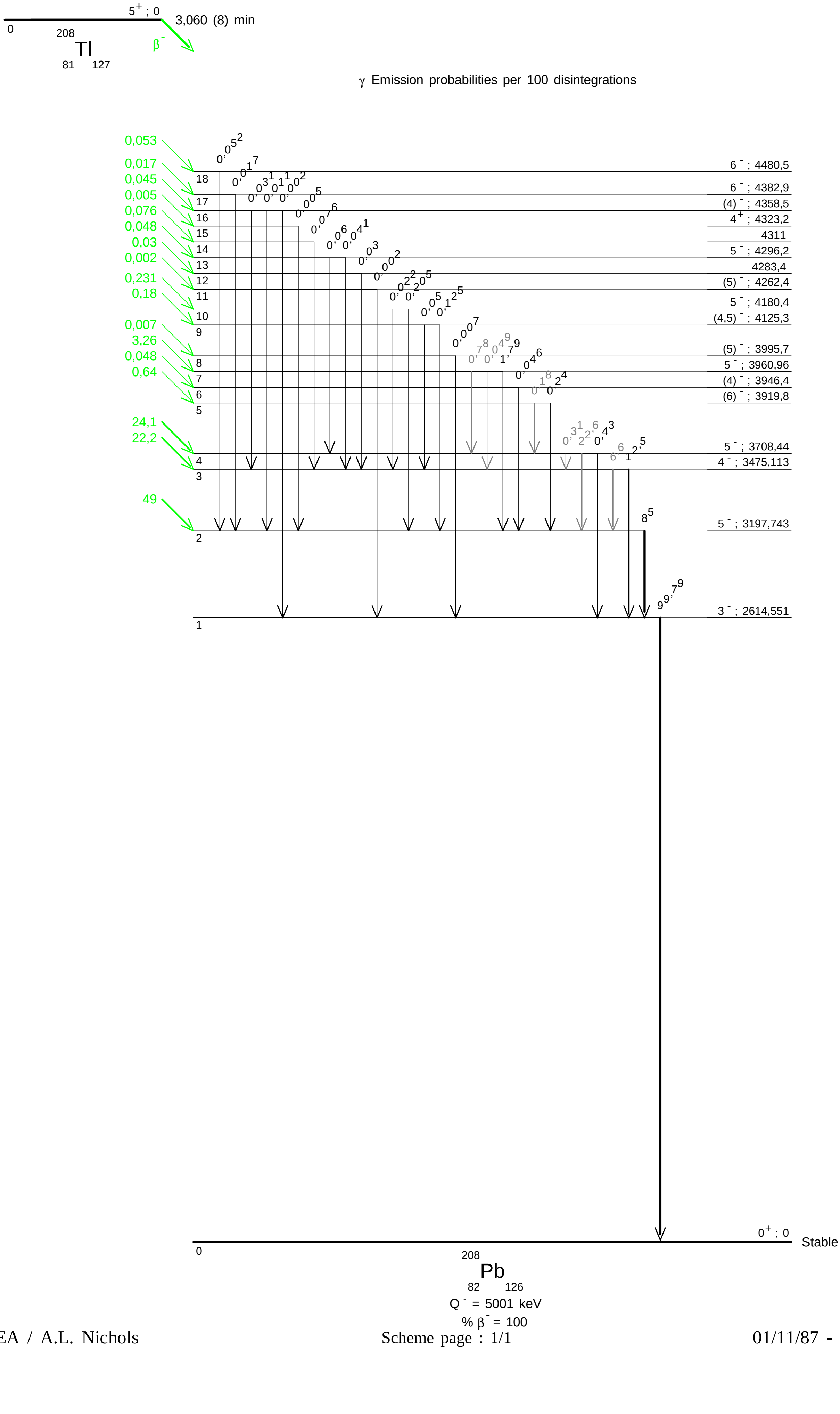
5+ ; 0
3,060 (8) min
β-
γ Emission probabilities per 100 disintegrations
6- ; 4480,5
6- ; 4382,9
(4)- ; 4358,5
4+ ; 4323,2
4311
5- ; 4296,2
4283,4
(5)- ; 4262,4
5- ; 4180,4
(4,5)- ; 4125,3
(5)- ; 3995,7
5- ; 3960,96
(4)- ; 3946,4
(6)- ; 3919,8
5- ; 3708,44
4- ; 3475,113
5- ; 3197,743
3- ; 2614,551
0+ ; 0
Stable
0,053
0,017
0,045
0,005
0,076
0,048
0,03
0,002
0,231
0,18
0,007
3,26
0,048
0,64
24,1
22,2
49
Pb
Q- = 5001 keV
% β- = 100