



1 Decay Scheme

Pb-214 disintegrates by beta minus emission to excited levels and to the ground state level of Bi-214.
Le plomb 214 se désintègre par émission bêta moins vers des niveaux excités et le niveau fondamental du bismuth 214.

2 Nuclear Data

$T_{1/2}(^{214}\text{Pb})$:	26,916	(44)	min
$T_{1/2}(^{214}\text{Bi})$:	19,8	(1)	min
$Q^-(^{214}\text{Pb})$:	1019	(11)	keV

2.1 β^- Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft
$\beta_{0,9}^-$	180 (11)	2,762 (22)	Allowed	4,5
$\beta_{0,8}^-$	222 (11)	0,0196 (27)	Allowed	6,9
$\beta_{0,7}^-$	485 (11)	1,047 (17)	1st Forbidden	6,2
$\beta_{0,5}^-$	667 (11)	46,52 (37)	1st Forbidden	5,1
$\beta_{0,4}^-$	729 (11)	41,09 (39)	1st Forbidden	5,2
$\beta_{0,0}^-$	1019 (11)	9,2 (7)	1st Forbidden	6,3

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}(\text{Bi})$	53,2275 (21)	14,71 (42)	M1 + E2		9,80 (29)	2,32 (7)	12,88 (39)
$\gamma_{(-1,0)}(\text{Bi})$	107,22 (9)	0,0068 (14)					
$\gamma_{(-1,1)}(\text{Bi})$	137,45 (30)	0,045 (18)					
$\gamma_{(-1,2)}(\text{Bi})$	141,3 (6)	0,027 (14)					

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{(-1,3)}$ (Bi)	170,07 (6)	0,0146 (27)					
$\gamma_{3,2}$ (Bi)	196,17 (10)	0,069 (9)					
$\gamma_{3,1}$ (Bi)	205,642 (30)	0,0114 (23)					
$\gamma_{(-1,4)}$ (Bi)	216,47 (7)	0,0100 (23)					
$\gamma_{4,1}$ (Bi)	241,997 (3)	13,72 (20)	M1(+E2)	0,724 (22)	0,1250 (38)	0,0295 (9)	0,888 (27)
$\gamma_{3,0}$ (Bi)	258,87 (3)	0,924 (13)	M1	0,601 (18)	0,1037 (31)	0,0244 (7)	0,737 (22)
$\gamma_{7,3}$ (Bi)	274,80 (5)	0,504 (15)	M1 + E2	0,295 (9)	0,0731 (22)	0,0179 (5)	0,392 (12)
$\gamma_{4,0}$ (Bi)	295,224 (2)	27,29 (26)	M1 + E2	0,390 (12)	0,0698 (21)	0,0165 (5)	0,482 (14)
$\gamma_{9,7}$ (Bi)	305,26 (3)	0,0324 (22)	[E1]	0,0241 (7)	0,00413 (12)	0,000971 (29)	0,0295 (9)
$\gamma_{6,2}$ (Bi)	314,32 (7)	0,077 (6)					
$\gamma_{6,1}$ (Bi)	323,83 (4)	0,0287 (32)					
$\gamma_{5,0}$ (Bi)	351,932 (2)	46,96 (37)	M1(+ E2)	0,260 (8)	0,0445 (13)	0,01049 (31)	0,319 (10)
$\gamma_{9,6}$ (Bi)	462,00 (7)	0,213 (6)					
$\gamma_{7,1}$ (Bi)	480,43 (2)	0,3838 (49)	M1(+E2)	0,1132 (34)	0,0192 (6)	0,00452 (14)	0,1384 (42)
$\gamma_{9,5}$ (Bi)	487,09 (7)	0,438 (6)	(E1)	0,00871 (26)	0,001423 (43)	0,000333 (10)	0,01058 (32)
$\gamma_{7,0}$ (Bi)	533,66 (2)	0,192 (10)	[M1,E2]	0,05 (3)	0,010 (4)	0,0023 (9)	0,06 (4)
$\gamma_{8,3}$ (Bi)	538,41 (9)	0,0196 (27)					
$\gamma_{9,4}$ (Bi)	543,81 (7)	0,050 (9)	E1 + M2	0,00696 (21)	0,001124 (34)	0,000262 (8)	0,00843 (25)
$\gamma_{9,3}$ (Bi)	580,13 (3)	0,372 (6)	(E1)	0,00611 (18)	0,000981 (29)	0,000229 (7)	0,00740 (22)
$\gamma_{(-1,5)}$ (Bi)	765,96 (9)	0,053 (8)					
$\gamma_{9,1}$ (Bi)	785,96 (9)	1,068 (13)	E1	0,00341 (10)	0,000533 (16)	0,0001239 (37)	0,00410 (12)
$\gamma_{9,0}$ (Bi)	839,00 (4)	0,589 (8)	(E1)	0,00302 (9)	0,000470 (14)	0,0001092 (33)	0,00363 (11)

3 Atomic Data

3.1 Bi

ω_K	:	0,964	(4)
$\bar{\omega}_L$:	0,391	(16)
$\bar{\omega}_M$:	0,031	(3)
n_{KL}	:	0,809	(5)
\bar{n}_{LM}	:	1,28	

3.1.1 X Radiations

	Energy keV	Relative probability	
X _K	K α_2	74,8157	
	K α_1	77,1088	
	K β_3	86,835	}
	K β_1	87,344	
	K β_5''	87,862	}
	K β_2	89,732	
	K β_4	90,074	}
	KO _{2,3}	90,421	
			34,25
			10,48

	Energy keV	Relative probability
X_L		
L ℓ	9,42	
L α	10,45 – 10,55	
L η	11,35	
L β	12,13 – 13,38	
L γ	14,31 – 16,36	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	57,49 – 63,42	100
KLX	70,02 – 77,10	56,2
KXY	82,45 – 90,52	9,2
Auger L	5,3 – 16,4	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Bi)	5,3 - 16,4	19,8 (3)
e _{AK}	(Bi)		0,80 (9)
	KLL	57,49 - 63,42	}
	KLX	70,02 - 77,10	}
	KXY	82,45 - 90,52	}
ec _{1,0} L	(Bi)	36,8400 - 39,8089	10,39 (31)
ec _{1,0} M	(Bi)	49,2284 - 50,6479	2,46 (8)
ec _{1,0} N	(Bi)	52,2893 - 53,0704	0,641 (20)
ec _{4,1} K	(Bi)	151,471 (3)	5,26 (16)
ec _{3,0} K	(Bi)	168,34 (3)	0,32 (1)
ec _{4,0} K	(Bi)	204,698 (2)	7,22 (23)
ec _{4,1} L	(Bi)	225,610 - 228,578	0,908 (28)
ec _{4,1} M	(Bi)	237,998 - 239,417	0,214 (7)
ec _{4,1} N	(Bi)	241,059 - 241,840	0,0560 (17)
ec _{3,0} L	(Bi)	242,48 - 245,45	0,0551 (17)
ec _{5,0} K	(Bi)	261,406 (2)	9,26 (29)
ec _{4,0} L	(Bi)	278,836 - 281,805	1,291 (40)
ec _{4,0} M	(Bi)	291,225 - 292,644	0,305 (10)

		Energy keV	Electrons per 100 disint.
ec _{4,0} N	(Bi)	294,286 - 295,067	0,0797 (25)
ec _{5,0} L	(Bi)	335,544 - 338,513	1,584 (46)
ec _{5,0} M	(Bi)	347,933 - 349,352	0,373 (11)
ec _{5,0} N	(Bi)	350,994 - 351,775	0,0975 (29)
$\beta_{0,9}^-$	max:	180 (11)	2,762 (22)
$\beta_{0,9}^-$	avg:	50 (3)	
$\beta_{0,8}^-$	max:	222 (11)	0,0196 (27)
$\beta_{0,8}^-$	avg:	62 (3)	
$\beta_{0,7}^-$	max:	485 (11)	1,047 (17)
$\beta_{0,7}^-$	avg:	145 (4)	
$\beta_{0,5}^-$	max:	667 (11)	46,52 (37)
$\beta_{0,5}^-$	avg:	207 (4)	
$\beta_{0,4}^-$	max:	724 (11)	41,09 (39)
$\beta_{0,4}^-$	avg:	227 (4)	
$\beta_{0,0}^-$	max:	1019 (11)	9,2 (7)
$\beta_{0,0}^-$	avg:	337 (4)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Bi)	9,42 — 16,36	12,42 (22)	
XK α_2	(Bi)	74,8157	6,26 (12)	} K α
XK α_1	(Bi)	77,1088	10,47 (20)	
XK β_3	(Bi)	86,835	}	K' β_1
XK β_1	(Bi)	87,344	}	
XK β_5''	(Bi)	87,862	}	
XK β_2	(Bi)	89,732	}	K' β_2
XK β_4	(Bi)	90,074	}	
XKO _{2,3}	(Bi)	90,421	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}(\text{Bi})$	53,2275 (21)	1,060 (7)
$\gamma_{(-1,0)}(\text{Bi})$	107,22 (9)	0,0068 (14)
$\gamma_{(-1,1)}(\text{Bi})$	137,45 (30)	0,045 (18)
$\gamma_{(-1,2)}(\text{Bi})$	141,3 (6)	0,027 (14)
$\gamma_{(-1,3)}(\text{Bi})$	170,07 (6)	0,0146 (27)
$\gamma_{3,2}(\text{Bi})$	196,20 (5)	0,069 (9)
$\gamma_{3,1}(\text{Bi})$	205,68 (9)	0,0114 (23)
$\gamma_{(-1,4)}(\text{Bi})$	216,47 (7)	0,0100 (23)
$\gamma_{4,1}(\text{Bi})$	241,997 (3)	7,268 (22)
$\gamma_{3,0}(\text{Bi})$	258,87 (3)	0,5318 (36)
$\gamma_{7,3}(\text{Bi})$	274,80 (5)	0,362 (10)
$\gamma_{4,0}(\text{Bi})$	295,224 (2)	18,414 (36)
$\gamma_{9,7}(\text{Bi})$	305,26 (3)	0,0315 (21)
$\gamma_{6,2}(\text{Bi})$	314,32 (7)	0,077 (6)
$\gamma_{6,1}(\text{Bi})$	323,83 (4)	0,0287 (32)
$\gamma_{5,0}(\text{Bi})$	351,932 (2)	35,60 (7)
$\gamma_{9,6}(\text{Bi})$	462,00 (7)	0,213 (6)
$\gamma_{7,1}(\text{Bi})$	480,43 (2)	0,3371 (41)
$\gamma_{9,5}(\text{Bi})$	487,09 (7)	0,433 (6)
$\gamma_{7,0}(\text{Bi})$	533,66 (2)	0,182 (6)
$\gamma_{8,3}(\text{Bi})$	538,41 (8)	0,0196 (27)
$\gamma_{9,4}(\text{Bi})$	543,81 (7)	0,050 (9)
$\gamma_{9,3}(\text{Bi})$	580,13 (3)	0,369 (6)
$\gamma_{(-1,5)}(\text{Bi})$	765,96 (9)	0,053 (8)
$\gamma_{9,1}(\text{Bi})$	785,96 (9)	1,064 (13)
$\gamma_{9,0}(\text{Bi})$	839,04 (9)	0,587 (8)

6 Main Production Modes

$\left\{ \begin{array}{l} \text{Ra} - 226 \text{ decay chain} \\ \text{Possible impurities : Pb} - 210 \end{array} \right.$

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