$^{215}_{83}\mathrm{Bi}_{132}$

1 Decay Scheme

Bi-215 ground state ($J^\pi = (9/2^-)$) decays 100 % by beta-minus emission to various excited levels and the ground state of Po-215.
Le bismuth 215 se désintègre à 100 % par émissions bêta moins vers des états excités et le niveau fondamental du polonium 215.

2 Nuclear Data

$T_{1/2}(^{215}\mathrm{Bi})$	:	7,6	(2)	min
$T_{1/2}(^{215}\mathrm{Po})$	:	1,781	(4)	10^{-3} s
$Q^-(^{215}\mathrm{Bi})$	:	2189	(15)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,18}$	790 (15)	2,8 (1)	[1st forbidden non-unique]	6
$\beta^-_{0,17}$	895 (15)	2,0 (2)	[1st forbidden non-unique]	6,34
$\beta^-_{0,16}$	1013 (15)	0,2 (1)	[1st forbidden non-unique]	7,5
$\beta^-_{0,14}$	1111 (15)	0,7 (1)	[1st forbidden non-unique]	7,1
$\beta^-_{0,9}$	1354 (15)	1,5 (1)	[1st forbidden non-unique]	7,1
$\beta^-_{0,6}$	1512 (15)	0,5 (1)	[1st forbidden non-unique]	7,8
$\beta^-_{0,5}$	1581 (15)	0,7 (1)	(1st forbidden non-unique)	7,7
$\beta^-_{0,4}$	1671 (15)	0,3 (2)	(1st forbidden non-unique)	8,1
$\beta^-_{0,3}$	1787 (15)	0,5 (1)	(1st forbidden unique)	9
$\beta^-_{0,2}$	1895 (15)	30 (6)	(1st forbidden non-unique)	6,35
$\beta^-_{0,0}$	2189 (15)	61 (6)	(1st forbidden non-unique)	6,28

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{3,1}$(Po)	130,58 (1)	0,0505 (12)	M1+26,5%E2	3,19 (16)	0,94 (4)	0,234 (10)	4,44 (13)
$\gamma_{4,2}$(Po)	224,04 (7)	0,044 (7)	E2	0,1296 (19)	0,1407 (20)	0,0370 (6)	0,319 (5)
$\gamma_{1,0}$(Po)	271,228 (10)	2,34 (10)	M1+94%E2	0,111 (6)	0,0668 (11)	0,0173 (3)	0,201 (7)
$\gamma_{2,0}$(Po)	293,56 (4)	32 (2)	M1+50%E2	0,25 (4)	0,062 (4)	0,0152 (7)	0,34 (5)
$\gamma_{6,2}$(Po)	383,10 (8)	0,14 (7)					
$\gamma_{3,0}$(Po)	401,81 (1)	0,50 (8)	E2	0,0351 (5)	0,01528 (22)	0,00390 (6)	0,0555 (8)
$\gamma_{6,1}$(Po)	405,43 (7)	0,006 (1)					
$\gamma_{4,0}$(Po)	517,60 (6)	1,10 (8)	M1+50%E2	0,058 (9)	0,0115 (11)	0,00277 (24)	0,073 (10)
$\gamma_{9,2}$(Po)	541,76 (22)	0,21 (7)					
$\gamma_{9,1}$(Po)	564,09 (22)	0,67 (7)					
$\gamma_{5,0}$(Po)	608,30 (7)	0,67 (7)	(M1 + E2)				
$\gamma_{6,0}$(Po)	676,66 (7)	0,40 (7)					
$\gamma_{17,4}$(Po)	776,9 (1)	0,81 (14)					
$\gamma_{14,2}$(Po)	784 (2)	0,33 (7)					
$\gamma_{14,1}$(Po)	806,4 (20)	0,40 (7)					
$\gamma_{9,0}$(Po)	835,32 (22)	0,62 (7)					
$\gamma_{16,1}$(Po)	905 (2)	0,21 (7)					
$\gamma_{17,1}$(Po)	1023,3 (1)	0,62 (7)					
$\gamma_{18,2}$(Po)	1105,2 (4)	1,50 (7)					
$\gamma_{18,1}$(Po)	1127,6 (4)	0,48 (7)					
$\gamma_{17,0}$(Po)	1294,5 (1)	0,62 (7)					
$\gamma_{18,0}$(Po)	1398,8 (4)	0,81 (7)					

3 Atomic Data

3.1 Po

ω_K : 0,965 (4)
$\bar{\omega}_L$: 0,403 (16)
n_{KL} : 0,807 (5)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	Kα_2	76,864		60
	Kα_1	79,293		100
	Kβ_3	89,256	}	
	Kβ_1	89,807	}	
	Kβ''_5	90,363	}	34
	Kβ_2	92,263	}	
	Kβ_4	92,618	}	10,7
	K$O_{2,3}$	92,983	}	

		Energy keV	Relative probability
X_L			
	Lℓ	9,658	
	Lα	11,016 – 11,13	
	Lη	12,085	
	Lβ	12,823 – 13,778	
	Lγ	15,742 – 16,213	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	58,978 – 65,205	100
KLX	71,902 – 79,289	58
KXY	84,8 – 93,1	8,5
Auger L	5,434 – 10,934	3080

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Po)	5,434 - 10,934	4,0 (4)
e_{AK}	(Po)		0,22 (5)
	KLL	58,978 - 65,205	}
	KLX	71,902 - 79,289	}
	KXY	84,8 - 93,1	}
$ec_{1,0\ K}$	(Po)	178,13 (1)	0,22 (1)
$ec_{2,0\ K}$	(Po)	200,46 (4)	6,0 (4)
$ec_{1,0\ L}$	(Po)	254,30 - 257,42	0,13 (1)
$ec_{2,0\ L}$	(Po)	276,63 - 279,75	1,5 (1)
$ec_{2,0\ M+}$	(Po)	289,41 - 293,56	0,7 (1)
$\beta^-_{0,18}$	max:	790 (15)	2,8 (1)
$\beta^-_{0,18}$	avg:	249 (6)	

		Energy keV		Electrons per 100 disint.
$\beta^-_{0,17}$	max:	895	(15)	2,0 (2)
$\beta^-_{0,17}$	avg:	287	(6)	
$\beta^-_{0,16}$	max:	1013	(15)	0,2 (1)
$\beta^-_{0,16}$	avg:	332	(6)	
$\beta^-_{0,14}$	max:	1111	(15)	0,7 (1)
$\beta^-_{0,14}$	avg:	370	(6)	
$\beta^-_{0,9}$	max:	1354	(15)	1,5 (1)
$\beta^-_{0,9}$	avg:	465	(6)	
$\beta^-_{0,6}$	max:	1512	(15)	0,5 (1)
$\beta^-_{0,6}$	avg:	528	(6)	
$\beta^-_{0,5}$	max:	1581	(15)	0,7 (1)
$\beta^-_{0,5}$	avg:	556	(6)	
$\beta^-_{0,4}$	max:	1671	(15)	0,3 (2)
$\beta^-_{0,4}$	avg:	593	(6)	
$\beta^-_{0,3}$	max:	1787	(15)	0,5 (1)
$\beta^-_{0,3}$	avg:	619	(6)	
$\beta^-_{0,2}$	max:	1895	(15)	30 (6)
$\beta^-_{0,2}$	avg:	685	(6)	
$\beta^-_{0,0}$	max:	2189	(15)	61 (6)
$\beta^-_{0,0}$	avg:	808	(6)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Po)	9,658 — 16,213		2,7 (3)	
XKα_2	(Po)	76,864		1,8 (3)	} Kα
XKα_1	(Po)	79,293		3,0 (5)	}
XKβ_3	(Po)	89,256	}		
XKβ_1	(Po)	89,807	}	1,02 (16)	K$'\beta_1$
XKβ''_5	(Po)	90,363	}		
XKβ_2	(Po)	92,263	}		
XKβ_4	(Po)	92,618	}	0,32 (5)	K$'\beta_2$
XKO$_{2,3}$	(Po)	92,983	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{3,1}$(Po)	130,58 (1)	0,0093 (10)
$\gamma_{4,2}$(Po)	224,04 (7)	0,033 (5)
$\gamma_{1,0}$(Po)	271,228 (10)	1,95 (7)
$\gamma_{2,0}$(Po)	293,56 (4)	23,8 (9)
$\gamma_{6,2}$(Po)	383,10 (8)	0,14 (7)
$\gamma_{3,0}$(Po)	401,81 (1)	0,48 (7)
$\gamma_{6,1}$(Po)	405,43 (7)	0,006 (1)
$\gamma_{4,0}$(Po)	517,60 (6)	1,02 (8)
$\gamma_{9,2}$(Po)	541,76 (22)	0,21 (7)
$\gamma_{9,1}$(Po)	564,09 (22)	0,67 (7)
$\gamma_{5,0}$(Po)	608,30 (7)	0,67 (7)
$\gamma_{6,0}$(Po)	676,66 (7)	0,40 (7)
$\gamma_{17,4}$(Po)	776,9 (1)	0,81 (14)
$\gamma_{14,2}$(Po)	784 (2)	0,33 (7)
$\gamma_{14,1}$(Po)	806,4 (20)	0,40 (7)
$\gamma_{9,0}$(Po)	835,32 (22)	0,62 (7)
$\gamma_{16,1}$(Po)	905 (2)	0,21 (7)
$\gamma_{17,1}$(Po)	1023,3 (1)	0,62 (7)
$\gamma_{18,2}$(Po)	1105,2 (4)	1,50 (7)
$\gamma_{18,1}$(Po)	1127,6 (4)	0,48 (7)
$\gamma_{17,0}$(Po)	1294,5 (1)	0,62 (7)
$\gamma_{18,0}$(Po)	1398,8 (4)	0,81 (7)

6 Main Production Modes

$U - 235\ (4n + 3)$ decay chain

$Th - 232(p,x)Bi - 215$

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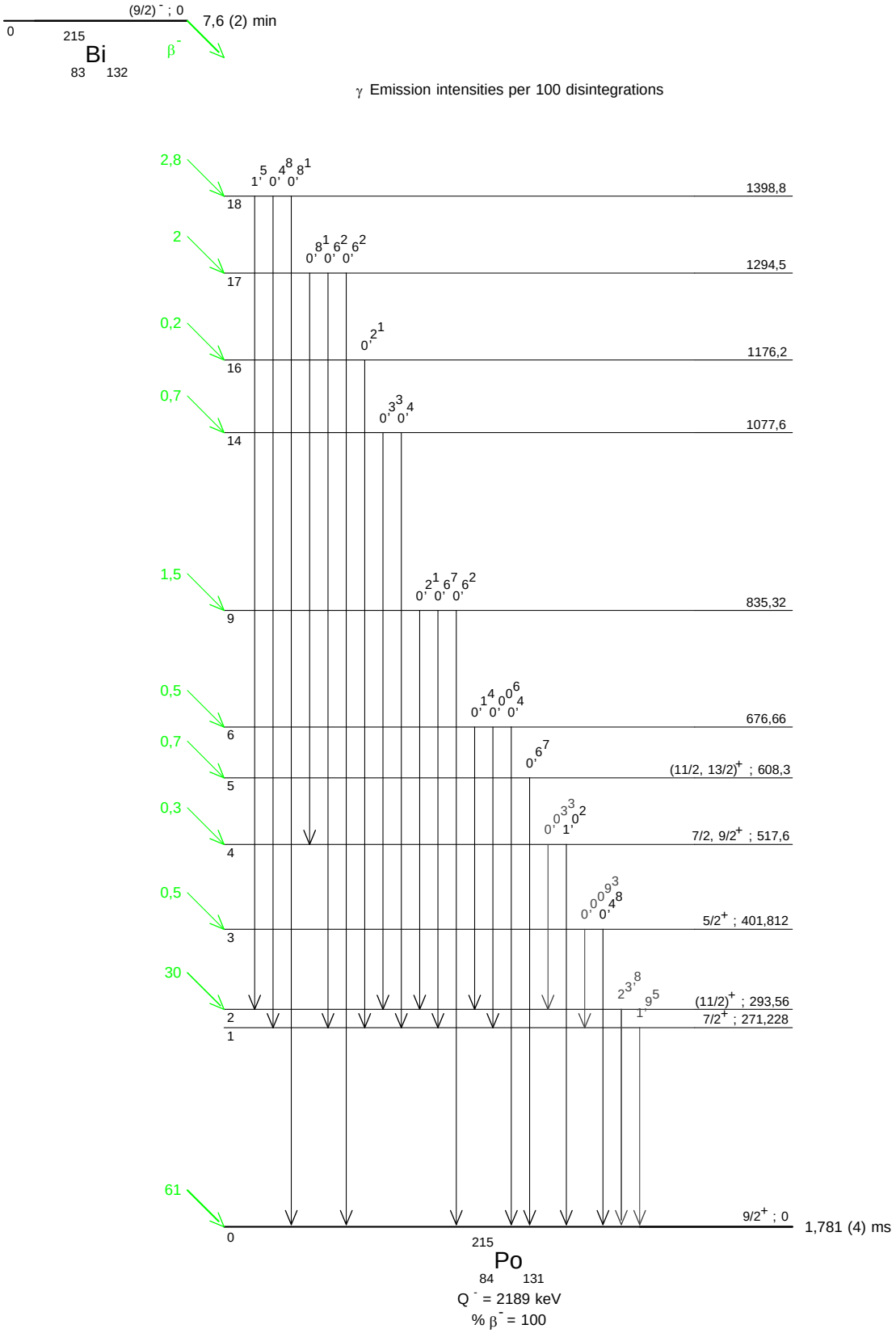
(9/2)⁻ ; 0
7,6 (2) min
0
215
Bi
83 132
β⁻
γ Emission intensities per 100 disintegrations
2,8
1398,8
18
2
1294,5
17
0,2
1176,2
16
0,7
1077,6
14
1,5
835,32
9
0,5
676,66
6
0,7
(11/2, 13/2)⁺ ; 608,3
5
0,3
7/2, 9/2⁺ ; 517,6
4
0,5
5/2⁺ ; 401,812
3
30
(11/2)⁺ ; 293,56
2
7/2⁺ ; 271,228
1
61
9/2⁺ ; 0
0
1,781 (4) ms
215
Po
84 131
Q⁻ = 2189 keV
% β⁻ = 100