



1 Decay Scheme

Tl-206 disintegrates 100% by beta minus emissions to the ground state level of Pb-206 mainly.

Le thallium 206 se désintègre par émissions beta moins essentiellement vers le niveau fondamental de plomb 206.

2 Nuclear Data

$$T_{1/2}({}^{206}\text{Tl}) : 4,202 \quad (11) \quad \text{min}$$

$$Q^{-}({}^{206}\text{Tl}) : 1532,4 \quad (6) \quad \text{keV}$$

2.1 β^{-} Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>
$\beta_{0,2}^{-}$	366,0 (8)	0,110 (14)	1st Forbidden	6
$\beta_{0,1}^{-}$	729,3 (6)	0,0051 (3)	Unique 1st Forbidden	8,6
$\beta_{0,0}^{-}$	1532,4 (6)	99,885 (14)	1st Forbidden	5,2

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	P _{$\gamma+ce$} × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{2,1}(\text{Pb})$	363,3 (5)	0,00015 (15)	E2	0,0414 (12)	0,0187 (6)	0,00476 (14)	0,0663 (20)
$\gamma_{1,0}(\text{Pb})$	803,06 (3)	0,0051 (3)	E2	0,00801 (24)	0,00174 (5)	0,000419 (13)	0,01030 (31)
$\gamma_{2,0}(\text{Pb})$	1166,4	0,110 (14)	E0				

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	Kα ₂	72,8049		59,5
	Kα ₁	74,97		100
	Kβ ₃	84,451	}	34,18
	Kβ ₁	84,937	}	
	Kβ ₅ ^{''}	85,47	}	
	Kβ ₂	87,238	}	10,32
	Kβ ₄	87,58	}	
	KO _{2,3}	87,911	}	
X _L	Lℓ	9,19		
	Lα	10,449 – 10,551		
	Lη	11,349		
	Lβ	12,144 – 12,795		
	Lγ	14,308 – 15,217		

3.1.2 Auger Electrons

		Energy keV	Relative probability
Auger K			
	KLL	56,028 – 61,669	100
	KLX	68,181 – 74,969	55,8
	KXY	80,3 – 88,0	7,78
Auger L			
		5,2 – 15,7	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Pb)	5,2 - 15,7	
e _{AK}	(Pb)		0,0034 (6)
	KLL	56,028 - 61,669	}
	KLX	68,181 - 74,969	}
	KXY	80,3 - 88,0	}
ec _{2,0} K	(Pb)	1078,4	0,093 (11)
ec _{2,0} L	(Pb)	1150,54 - 1151,20	0,017 (3)
$\beta_{0,2}^-$	max:	366,0 (8)	0,110 (14)
$\beta_{0,2}^-$	avg:	104,52 (25)	
$\beta_{0,1}^-$	max:	729,3 (6)	0,0051 (3)
$\beta_{0,1}^-$	avg:	232,39 (21)	
$\beta_{0,0}^-$	max:	1532,4 (6)	99,885 (14)
$\beta_{0,0}^-$	avg:	538,86 (25)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Pb)	9,190 — 15,217	0,035 (4)	
XK α_2	(Pb)	72,8049	0,026 (3)	} K α
XK α_1	(Pb)	74,97	0,044 (5)	
XK β_3	(Pb)	84,451	}	K' β_1
XK β_1	(Pb)	84,937	}	
XK β_5''	(Pb)	85,47	}	
XK β_2	(Pb)	87,238	}	K' β_2
XK β_4	(Pb)	87,58	}	
XKO _{2,3}	(Pb)	87,911	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{2,1}(\text{Pb})$	363,3 (5)	0,00014 (14)
$\gamma_{1,0}(\text{Pb})$	803,06 (3)	0,0050 (3)

6 Main Production Modes

Tl – 205(n, γ)Tl – 206 σ : 0,10 (3) barns

Bi – 210 α – decay

Tl – 205(d,p)Tl – 206

Pb – 207(t, α)Tl – 206

Pb – 208(d, α)Tl – 206

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