



1 Decay Scheme

The Au-198 disintegrates following three beta minus transitions, the main one is to the 411 keV level of Hg-198.

L'or 198 se désintègre selon trois transitions bêta moins, la principale vers le niveau de 411 keV du mercure 198, les deux autres de plus faible intensité vers le niveau de 1087 keV et le niveau fondamental.

2 Nuclear Data

$$T_{1/2}({}^{198}\text{Au}) : 2,6944 \quad (8) \quad \text{d}$$

$$Q^{-}({}^{198}\text{Au}) : 1372,2 \quad (10) \quad \text{keV}$$

2.1 β^{-} Transitions

	Energy keV	Probability $\times 100$	Nature	lg <i>ft</i>
$\beta_{0,2}^{-}$	284,5 (10)	0,989 (8)	1st Forbidden	7,6
$\beta_{0,1}^{-}$	960,4 (10)	98,986 (10)	1st Forbidden	7,36
$\beta_{0,0}^{-}$	1372,2 (10)	0,025 (5)	Unique 1st Forbidden	12,27

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}(\text{Hg})$	411,80250 (17)	99,81 (9)	E2	0,0301 (2)	0,01091 (25)	0,0027 (2)	0,0447 (5)
$\gamma_{2,1}(\text{Hg})$	675,8849 (7)	0,827 (7)	M1+56(5)%E2	0,0211 (15)	0,00380 (26)	0,00090 (7)	0,0261 (18)
$\gamma_{2,0}(\text{Hg})$	1087,6874 (7)	0,1598 (30)	E2	0,00419 (13)	0,000761 (23)	0,000179 (5)	0,00519 (16)

3 Atomic Data

3.1 Hg

$$\begin{aligned}\omega_K &: 0,962 \quad (4) \\ \bar{\omega}_L &: 0,355 \quad (14) \\ n_{KL} &: 0,813 \quad (4)\end{aligned}$$

3.1.1 X Radiations

	Energy keV	Relative probability		
X _K	K α_2	68,895	59	
	K α_1	70,819	100	
	K β_3	79,822	}	
	K β_1	80,253		
	K β_5''	80,75		33,9
	K β_2	82,435	}	
	K β_4	82,776		9,94
	KO _{2,3}	83,028		
	X _L	L ℓ	8,721	
		L α	9,898 – 9,989	
L η		10,651		
L β		11,358 – 12,56		
L γ		13,41 – 14,474		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	53,17 – 58,28	100
KLX	64,59 – 70,81	55,2
KXY	75,92 – 83,08	7,62
Auger L	5,1 – 14,8	32

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e _{AL}	(Hg)	5,1	- 14,8	2,170 (24)
e _{AK}	(Hg)			0,110 (12)
	KLL	53,17	- 58,28	}
	KLX	64,59	- 70,81	}
	KXY	75,92	- 83,08	}
ec _{1,0} K	(Hg)	328,7002	(5)	2,876 (19)
ec _{1,0} L	(Hg)	396,963	- 399,519	1,042 (24)
ec _{1,0} M	(Hg)	408,241	- 409,508	0,258 (19)
$\beta_{0,2}^-$	max:	284,5	(10)	0,989 (8)
$\beta_{0,2}^-$	avg:	79,4	(3)	
$\beta_{0,1}^-$	max:	960,4	(10)	98,986 (10)
$\beta_{0,1}^-$	avg:	314,5	(3)	
$\beta_{0,0}^-$	max:	1372,2	(10)	0,025 (5)
$\beta_{0,0}^-$	avg:	466	(1)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.
XL	(Hg)	8,721	— 14,474	1,21 (2)
XK α_2	(Hg)	68,895		0,809 (8) } K α
XK α_1	(Hg)	70,819		1,372 (12) }
XK β_3	(Hg)	79,822	}	
XK β_1	(Hg)	80,253	}	0,466 (8) K' β_1
XK β_5''	(Hg)	80,75	}	
XK β_2	(Hg)	82,435	}	
XK β_4	(Hg)	82,776	}	0,136 (4) K' β_2
XKO _{2,3}	(Hg)	83,028	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}(\text{Hg})$	411,80205 (17)	95,54 (7)
$\gamma_{2,1}(\text{Hg})$	675,8836 (7)	0,806 (7)
$\gamma_{2,0}(\text{Hg})$	1087,6842 (7)	0,159 (3)

6 Main Production Modes

$$\left\{ \begin{array}{l} \text{Au} - 197(n,\gamma)\text{Au} - 198 \quad \sigma : 98,8 (3) \text{ barns} \\ \text{Possible impurities : Au} - 199 \end{array} \right.$$

7 References

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