

^{209}Hg β^- decay [1998Zh22](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. Chen [#] and F. G. Kondev		NDS 126, 373 (2015)	30-Sep-2013

Parent: ^{209}Hg : $E=0.0$; $J^\pi=(9/2^+)$; $T_{1/2}=36\text{ s}+7-4$; $Q(\beta^-)=4990\text{ SY}$; $\% \beta^-$ decay=100.0

^{209}Hg - J^π , $T_{1/2}$: From Adopted Levels of ^{209}Hg .

^{209}Hg - $Q(\beta^-)$: From [2012Wa38](#), $\Delta Q(\beta^-)=150$.

[1998Zh22](#) (also [1998Zh19](#)): ^{209}Hg produced in $\text{Pb}(^{18}\text{O},\text{X})$ at 600 MeV at the HIRFL facility in China. γ -rays were detected by a large BGO detector (FWHM=1.9 keV at $E_\gamma=1.33\text{ MeV}$) and the β -particles were detected by a 25 mm-diameter plastic scintillators of the $4\pi\Delta E_\beta$ -type. Measured E_γ , I_γ , $\beta\gamma$ -coin. Deduced levels.

[1998Zh22](#) constructed the level scheme for ^{209}Tl from the γ -transitions based on the only fact that the timings of these transitions are all similar to that of the 324γ in ^{209}Tl . This makes these transitions except 324γ questionable considering the possibility of wrong assignments. Also, if the parent has $J^\pi=(9/2^+)$, it should decay predominantly to the $J^\pi=(9/2^+)$ and $(7/2^+)$ levels at $E\approx 1000\text{ keV}$ and $E\approx 1100\text{ keV}$ in ^{209}Tl , respectively, which will most probably feed the low-lying states, supporting the argument above. However, there could be another possibility, which can not be excluded, that these transitions could be from decays of an low-spin isomer in ^{209}Hg instead of the $J^\pi=(9/2^+)$ ground state.

The decay scheme is incomplete, thus absolute γ - and β^- -ray emission probabilities, and $\log ft$ values were not deduced.

 ^{209}Tl Levels

$E(\text{level})^\dagger$	$J^\pi^\ddagger$
0.0	$1/2^+$
324.0 4	$3/2^+$
738.4 4	
946.6 8	
1748.2 6	$(5/2^+)$

[†] From a least-squares fit to E_γ .

[‡] From Adopted Levels.

 $\gamma(^{209}\text{Tl})$

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	$\alpha^\ddagger$	Comments
208.2 6	51 16	946.6		738.4					
324.0 4	100	324.0	$3/2^+$	0.0	$1/2^+$	M1+E2	1.30 +23-19	0.174 18	$\alpha(\text{K})=0.131\text{ }16$; $\alpha(\text{L})=0.0330\text{ }15$; $\alpha(\text{M})=0.0080\text{ }3$ $\alpha(\text{N})=0.00202\text{ }8$; $\alpha(\text{O})=0.000377\text{ }17$; $\alpha(\text{P})=2.80\times 10^{-5}\text{ }25$ Mult., δ : from Adopted Gammas.
738.4 4	56 20	738.4		0.0	$1/2^+$				
1424.2 4	111 39	1748.2	$(5/2^+)$	324.0	$3/2^+$				

[†] From [1998Zh22](#).

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{209}Hg β^- decay 1998Zh22Decay SchemeIntensities: Relative I_γ

Legend

