

¹⁹⁸Hg($\alpha,3n\gamma$) 1981He07,1988Ro08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 108, 79 (2007)	15-Oct-2006

1981He07 (also 1977He06): E=35-45 MeV; measured E γ , I γ , excit, $\gamma(\theta)$, $\gamma\gamma$, $\gamma\gamma(t)$.

1988Ro08: E=41 MeV; measured E γ , I γ , $\gamma(\theta)$, $\gamma(\theta,H,t)$, $\gamma\gamma(t)$.

1985St16: E=60 MeV; measured $\gamma(\theta,H,t)$, $\gamma(t)$.

Other: 1978Ri01.

The level scheme is basically that of 1988Ro08, based on their experiments and the earlier results of 1985St16, 1981He07, 1978Ri01 and 1978Ri04. The evaluator has made the following changes: 1. All E(level) have been recalculated placing the 5/2⁻ level at 0+x ($x \leq 9.3$ keV), rather than at 19.6. 2. The E γ of the three proposed but unobserved low energy transitions have been replaced with the corresponding E γ from the (¹⁸O,5n γ). 3. The placements of the 830.0 γ and 903.6 γ are from the (¹⁸O,5n γ).

¹⁹⁹Pb Levels

E(level)	J $^{\pi \dagger}$	T _{1/2}	Comments
0+x	(5/2 ⁻)		E(level): $x \leq 9.3$ from ¹⁹⁹ Pb IT decay.
424.8+x	(13/2 ⁺)		
1402.36+x	(17/2 ⁺)		
1437.39+x	(15/2 ⁺)		
1825.86+x	(19/2 ⁺)	<2 ns	T _{1/2} : from 1981He07.
1841.96+x	(21/2 ⁺)		
1971.64+x	(19/2 ⁺)		
2082.0+x	(21/2 ⁺) [‡]		
2127.26+x	(21/2 ⁻)	3.6 ns 7	T _{1/2} : from 1981He07.
2305.9+x	(21/2 ⁺) [‡]		
2451.4+x	(23/2 ⁻)		
2499.66+x	(25/2 ⁻)	7.5 ns 3	T _{1/2} : from 1988Ro08. Others: 11 ns 3 (1985St16), 33 ns 3 (1981He07).
2558.8+x	(29/2 ⁻)	10.0 μ s 2	g=-0.0742 2 (1988Ro08) g: other: -0.074 5 (1985St16). For pure $\nu(i_{13/2}^{-2} f_{5/2}^{-1})$, the expected value is -0.073. T _{1/2} : from 1988Ro08. Other: 10.6 μ s 5 (1981He07).
2570.7+x 4	(27/2 ⁻)		E(level),J $^{\pi}$: level from (¹⁸ O,5n γ).
3400.7+x	(29/2 ⁺)		
3489.4+x	(33/2 ⁺)	55 ns 5	g=-0.145 9 (1988Ro08) g: other: -0.152 3 (1985St16). For pure $\nu i_{13/2}^{-3}$ configuration, the expected value is -0.15. T _{1/2} : from 1988Ro08. Others: 58 ns 6 (1985St16), 55 ns 8 (1981He07).

[†] As proposed by 1988Ro08, unless otherwise stated.

[‡] From 'Adopted Levels'.

$\gamma(^{199}\text{Pb})$

A₂ and A₄ values are from 1981He07.

E γ^{\dagger}	I γ^{\ddagger}	E _i (level)	J _i $^{\pi}$	E _f	J _f $^{\pi}$	Mult.#	α^b	Comments
11.8 3		2570.7+x	(27/2 ⁻)	2558.8+x	(29/2 ⁻)			E γ : from 'adopted gammas'.
(48.3)		2499.66+x	(25/2 ⁻)	2451.4+x	(23/2 ⁻)			E γ : γ required from $\gamma\gamma(t)$ data (1988Ro08).
(59.1 ^a 3)		2558.8+x	(29/2 ⁻)	2499.66+x	(25/2 ⁻)	E2 ^a	72.3	
70.9 ^a 3		2570.7+x	(27/2 ⁻)	2499.66+x	(25/2 ⁻)	M1 ^a	4.94	
(88.4 ^a 3)		3489.4+x	(33/2 ⁺)	3400.7+x	(29/2 ⁺)	E2 ^a	10.5	
129.6 3	1.8 3	1971.64+x	(19/2 ⁺)	1841.96+x	(21/2 ⁺)	(M1) [@]	4.65	A ₂ =-0.10 4, A ₄ =-0.10 6.

Continued on next page (footnotes at end of table)

¹⁹⁸Hg($\alpha,3n\gamma$) **1981He07,1988Ro08 (continued)**

$\gamma(^{199}\text{Pb})$ (continued)

E_γ^\dagger	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.#	δ	a^b	Comments
155.6 2	6.4 7	2127.26+x	(21/2 ⁻)	1971.64+x	(19/2 ⁺)	(E1) [@]		0.147	Mult.: D+Q from A ₂ =-0.11 4, A ₄ =-0.03 6, E1 from 'Adopted Gammas'.
240.2 3	3.8 5	2082.0+x	(21/2 ⁺)	1841.96+x	(21/2 ⁺)				
301.4 1	63 4	2127.26+x	(21/2 ⁻)	1825.86+x	(19/2 ⁺)	E1		0.0294	A ₂ =-0.10 2, A ₄ =-0.09 4. Mult.: also from $\gamma(\theta)$ in g-factor measurement.
324.2 2	7.7 7	2451.4+x	(23/2 ⁻)	2127.26+x	(21/2 ⁻)				A ₂ =+0.40 3.
372.4 1	46 4	2499.66+x	(25/2 ⁻)	2127.26+x	(21/2 ⁻)	(E2)		0.0631	Mult.: from A ₂ =+0.06 2 and RUL.
388.5 2	16.2 14	1825.86+x	(19/2 ⁺)	1437.39+x	(15/2 ⁺)	(E2)		0.0562	Mult.: from A ₂ =+0.11 2 and RUL.
423.5 3	38 5	1825.86+x	(19/2 ⁺)	1402.36+x	(17/2 ⁺)	M1+E2	-1.0 4	0.11 3	A ₂ =-0.40 3, A ₄ =-0.11 5. δ : from g-factor experiment (1985St16).
424.9 3	30 4	424.8+x	(13/2 ⁺)	0+x	(5/2 ⁻)	M4 ^{&}		4.0	
439.6 2	25.0 18	1841.96+x	(21/2 ⁺)	1402.36+x	(17/2 ⁺)	Q			A ₂ =+0.18 3, A ₄ =-0.06 4.
569.3 3	2.0 4	1971.64+x	(19/2 ⁺)	1402.36+x	(17/2 ⁺)				A ₂ =+0.03 11.
830.0 2	9.2 9	3400.7+x	(29/2 ⁺)	2570.7+x	(27/2 ⁻)				A ₂ =-0.11 4, A ₄ =-0.07 6. E γ : placement from 'adopted gammas', consistent with the $\gamma\gamma$ coin evidence by 1988Ro08 that this γ feeds the 2505 level through unobserved low energy transitions.
903.4 2	9.6 10	2305.9+x	(21/2 ⁺)	1402.36+x	(17/2 ⁺)	Q			A ₂ =+0.29 4, A ₄ =-0.16 6. E γ : placement from 'adopted gammas'. γ assigned to a 25/2 ⁺ level at 2749 by 1981He07 and 1988Ro08.
977.4 1	100	1402.36+x	(17/2 ⁺)	424.8+x	(13/2 ⁺)	Q			A ₂ =+0.15 3, A ₄ =-0.11 4.
1012.4 3	26 3	1437.39+x	(15/2 ⁺)	424.8+x	(13/2 ⁺)	D(+Q)			A ₂ =-0.25 2, A ₄ =0.00 4.

[†] From 1981He07.

[‡] At 125° (1981He07).

[#] From $\gamma(\theta)$ (1981He07), unless otherwise indicated. The assignments match with those in 'Adopted Levels'. Mult=Q is most likely E2.

[@] From intensity balance considerations (1981He07).

[&] From 'adopted gammas'.

^a from 'adopted gammas'; γ not observed in this experiment.

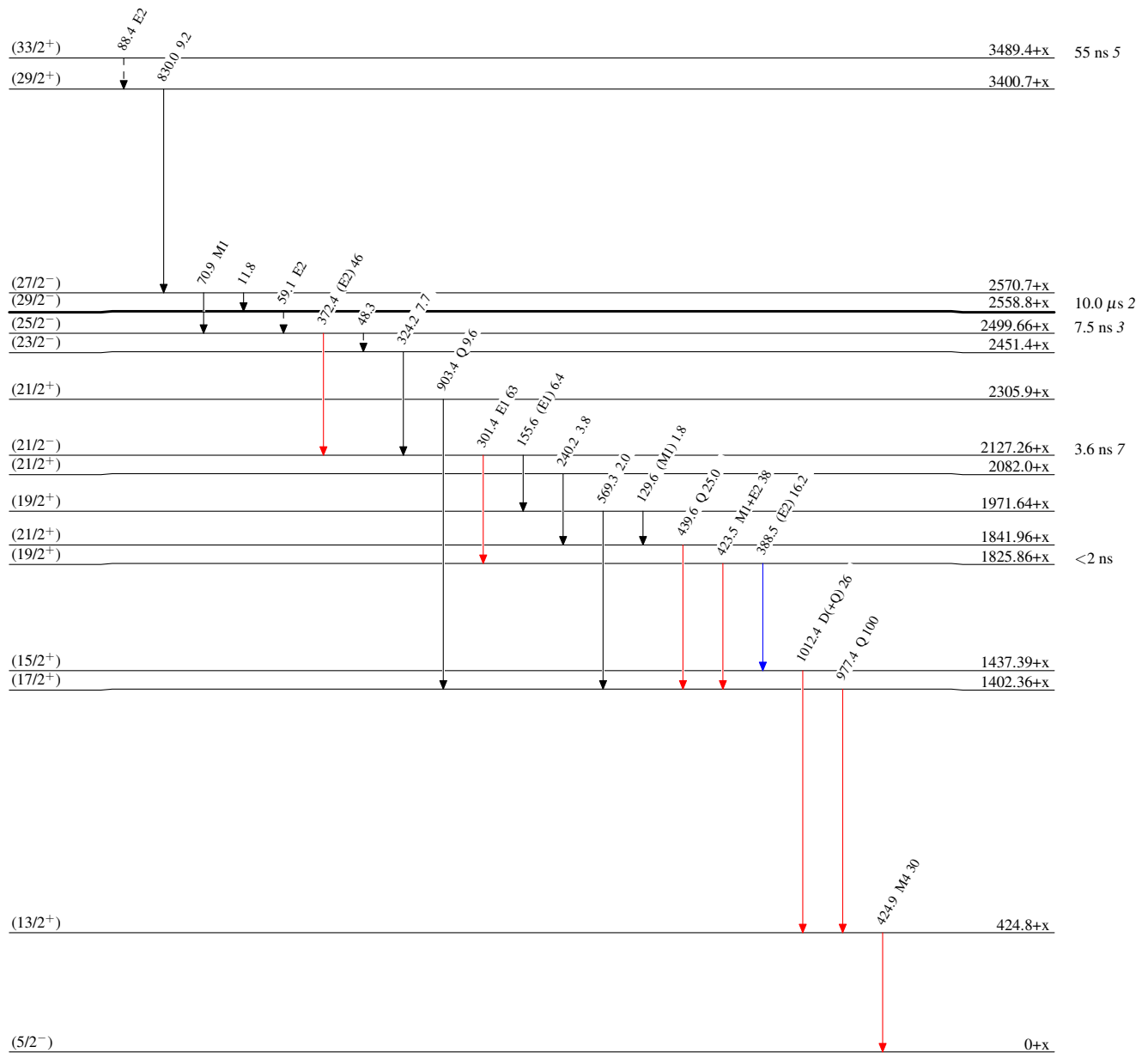
^b Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

$^{198}\text{Hg}(\alpha,3n\gamma)$ 1981He07,1988Ro08

Legend

Level Scheme
Intensities: Relative I_γ

- ▶ $I_\gamma < 2\% \times I_\gamma^{max}$
- ▶ $I_\gamma < 10\% \times I_\gamma^{max}$
- ▶ $I_\gamma > 10\% \times I_\gamma^{max}$
- - - -▶ γ Decay (Uncertain)



$^{199}\text{Pb}_{117}$