^{198}Pt(α,3nγ) 1974Pr09,1978Me11

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

1974Pr09: E=37 MeV. Target 60% enriched, assignments based upon $\gamma\gamma$ coin, $\gamma(\theta)$ At two angles, Iγ.
1978Me11: E=31 to 57 MeV. Measured Eγ, Iγ, $\gamma\gamma$, ce, Ce(t) with orange spectrometer.

^{199}Hg Levels

The two bands described here follow qualitatively the predictions of the rotation-aligned coupling scheme. These results indicate oblate deformation, so that the spherical lead region and the prolate deformed rare-earth region are connected by a transitional region of oblate deformation. See also 1974Pr09 for details.

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0	1/2$^-$		
158.4	5/2$^-$		
532.5[#]	13/2$^+$	42.67 min *9*	T$_{1/2}$: from 'Adopted Levels'. Additional information 1.
823.9[#] *2*	(17/2$^+$)		E(level): 832.9 In 1974Pr09 is a misprint.
1274.1?[&] *2*	(15/2$^+$)		
1357.2[#] *3*	(21/2$^+$)		
1769.3[&] *3*	(19/2$^+$)		E(level): level from 1974Pr09 only; 1778.1 is a misprint.
2107.3[#] *4*	(25/2$^+$)		
2332.0[@] *4*	(21/2$^-$)		
2425.6[@] *4*	(23/2$^-$)		
2487.8[@] *4*	(25/2$^-$)		
2629.8[@] *4*	(27/2$^-$)		
2765.9[@] *5*	(29/2$^-$)		
3068.5[@] *4*	(31/2$^-$)		

[†] From least-squares fit to Eγ's, relative to the energy of the 532.5 level (from 'Adopted Levels') held As fixed In the fitting procedure.
[‡] From 'Adopted Levels' for first three levels, from proposed band structures for higher levels (same assignments given in 'Adopted Levels
levels').
[#] Band(A): decoupled band built on $\nu i_{13/2}$. Oblate deformation is expected in rotation-alignment model (1974Pr09). Search (by 1978Me11) for the 29/2$^+$ member of this band was unsuccessful. For Eγ<1 MeV, Iγ(29/2 to 25/2) is <5. This supports the idea that the g.s. bands in even-even Hg change their character from configuration=$\pi h^{-2}_{11/2}$ for A≤196 to configuration=$\nu i^{-2}_{13/2}$ for A≥198, thus changing the blocking pattern in the neighboring odd-A Hg.
[@] Band(B): $\nu i^{-1}_{13/2}\otimes$(5$^-$,7$^-$,9$^-$..^{198}Hg core) (?).
[&] Band(C): unfavored band built on $\nu i_{13/2}$.

$\gamma(^{199}Hg)$

Eγ[#]	Iγ[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
141.6[&c]	<3.8	2629.8	(27/2$^-$)	2487.8	(25/2$^-$)	Iγ: from I(141.6γ)/I(204.3γ)<2 (1974Pr09). A$_2$=+0.21 *10* (1974Pr09).
155.8[&c]	1.7	2487.8	(25/2$^-$)	2332.0	(21/2$^-$)	Iγ: from I(155.8γ)/I(380.5γ)=0.10 (1974Pr09).
(158.4[@])		158.4	5/2$^-$	0.0	1/2$^-$	
204.3 *2*	1.9 *4*	2629.8	(27/2$^-$)	2425.6	(23/2$^-$)	

Continued on next page (footnotes at end of table)

^{198}Pt(α,3nγ) 1974Pr09,1978Me11 (continued)

$\gamma(^{199}Hg)$ (continued)

E_γ[#]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	α[b]	Comments
278.1 *2*	7.8 *16*	2765.9	(29/2$^-$)	2487.8	(25/2$^-$)	(Q)			A_2=+0.41 *10* (1974Pr09).
291.4 *2*	100	823.9	(17/2$^+$)	532.5	13/2$^+$	(Q)			A_2=+0.40 *5* (1974Pr09).
(374.1[@])		532.5	13/2$^+$	158.4	5/2$^-$				
380.5 *2*	17 *4*	2487.8	(25/2$^-$)	2107.3	(25/2$^+$)	E1		0.01614	α(K)=0.01334; α(L)=0.00215; α(M)=0.00050; α(N+..)=0.00016 Mult.: A_2=+0.51 *15* (1974Pr09), α(K)exp=0.014 *3* (1978Me11).
[x]401.6[a] *5*									$\gamma\gamma$ coin with 278γ, 291γ, 381γ, 533γ and 750γ (1978Me11).
438.7 *2*	5.1 *10*	3068.5	(31/2$^-$)	2629.8	(27/2$^-$)	(Q)			A_2=+0.2 *2* (1974Pr09).
[x]510.8[a] *2*	≤13								$\gamma\gamma$ coin with 291γ, 533γ and 750γ (1978Me11). α(K)exp≥0.013 (1978Me11), assignment to ^{199}Hg uncertain.
522.3 *2*	9.3 *19*	2629.8	(27/2$^-$)	2107.3	(25/2$^+$)				A_2=−0.04 *20* (1974Pr09).
533.3 *2*	71 *14*	1357.2	(21/2$^+$)	823.9	(17/2$^+$)	(Q)			A_2=+0.49 *8* (1974Pr09).
[x]651.0[a] *2*	4.0 *8*								$\gamma\gamma$ coin with 291γ and 533γ (1978Me11).
741.6 *2*	6.3 *13*	1274.1?	(15/2$^+$)	532.5	13/2$^+$	M1+E2	−1.3 *5*	0.020 *6*	α(K)=0.016 *5*; α(L)=0.0029 *7* Mult.,δ: A_2=−1.23 *20* (1974Pr09), α(K)exp=0.016 *3* (1978Me11).
749.9 *2*	31 *6*	2107.3	(25/2$^+$)	1357.2	(21/2$^+$)	(Q)			A_2=+0.46 *15* (1974Pr09).
945.4 *2*	6.8 *14*	1769.3	(19/2$^+$)	823.9	(17/2$^+$)	(D+Q)			E_γ: placement from 1974Pr09. A_2=−1.03 *20* (1974Pr09).
974.8 *2*	6.3 *13*	2332.0	(21/2$^-$)	1357.2	(21/2$^+$)	(D)			A_2=+0.32 *15* (1974Pr09) consistent with ΔJ=0, dipole.
[x]1002.4 *2*	5.0 *10*								$\gamma\gamma$ coin with 291γ, 533γ and 750γ (1978Me11).
[x]1005.7 *2*	3.6 *7*								$\gamma\gamma$ coin with 291γ (1978Me11).
1068.6 *2*	11 *2*	2425.6	(23/2$^-$)	1357.2	(21/2$^+$)	(D)			A_2=−0.49 *15* (1974Pr09).
[x]1127.2 *4*	3.2 *7*					D+Q			$\gamma\gamma$ coin with 278γ, 291γ, 381γ, 402γ, 533γ and 750γ (1978Me11). Placement (by 1974Pr09) from a 2484 level to 1357 is not supported by $\gamma\gamma$ coin data of 1978Me11. A_2=−0.77 *20* (1974Pr09).

[†] From $\gamma(\theta)$ of 1974Pr09 and ce data of 1978Me11. Since $\gamma(\theta)$ data alone are insensitive to parity determination, the evaluator has assigned mult=Q to ΔJ=2 transitions indicated by positive A_2 (1974Pr09 assign E2), and mult=D or D+Q to ΔJ=1 transitions indicated by negative A_2 (1974Pr09 assign E1 or M1+E2 to such transitions).

[‡] From 1978Me11 at E(α)=35 MeV. Values are also available at 31 and 39 MeV from 1978Me11; and at 37 MeV from 1974Pr09.

[#] Average of 1974Pr09 and 1978Me11.

[@] Not observed in coin because of delay at 13/2$^+$ level, rounded energy from 'Adopted Gammas'.

[&] γ from 1974Pr09 only.

[a] γ from 1978Me11 only.

[b] 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.

Continued on next page (footnotes at end of table)

^{198}Pt(α,3nγ) 1974Pr09,1978Me11 (continued)

$\gamma(^{199}Hg)$ (continued)

[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

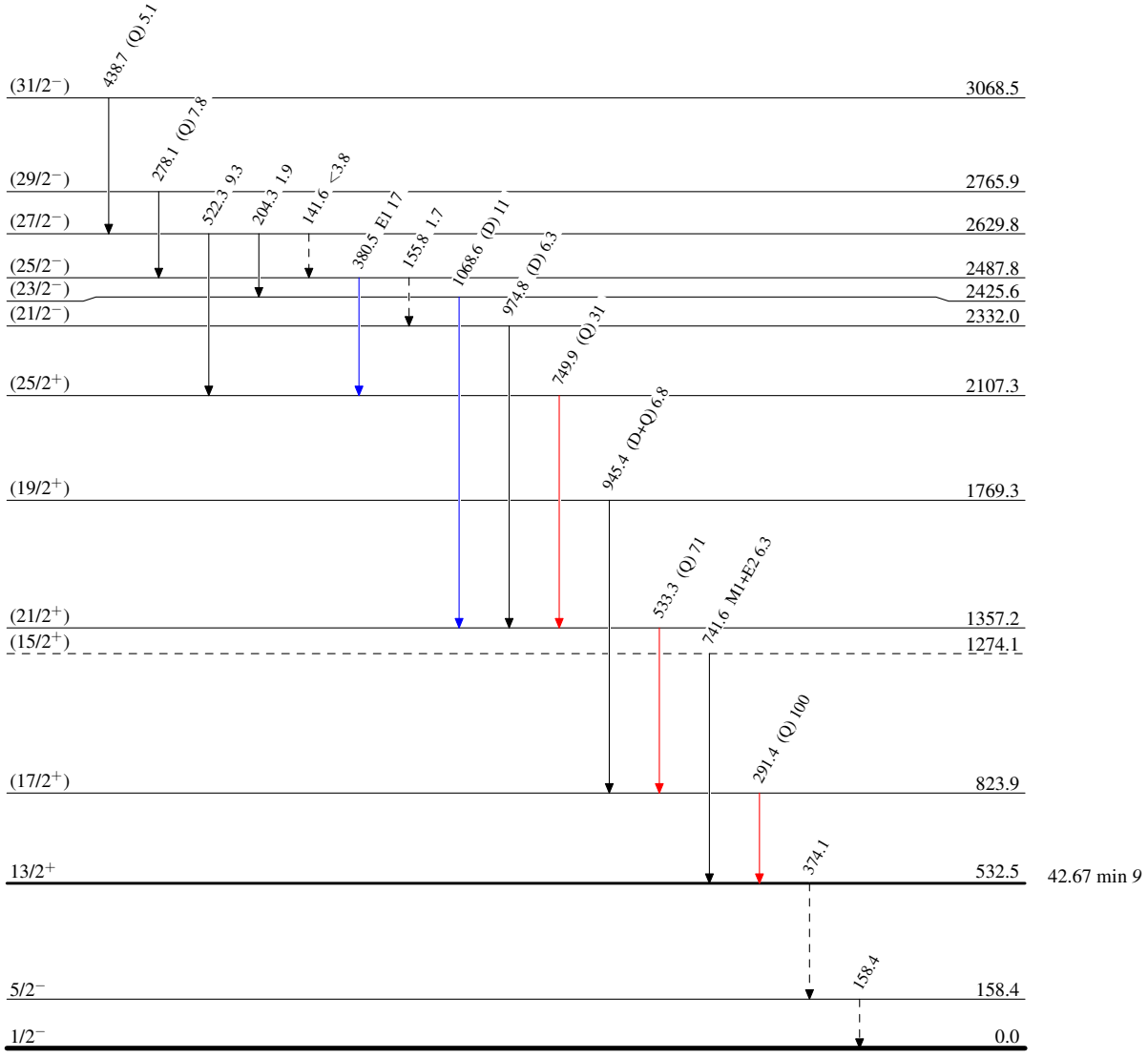
^{198}**Pt(α,3nγ)** **1974Pr09,1978Me11**

Level Scheme

Intensities: Relative I_γ

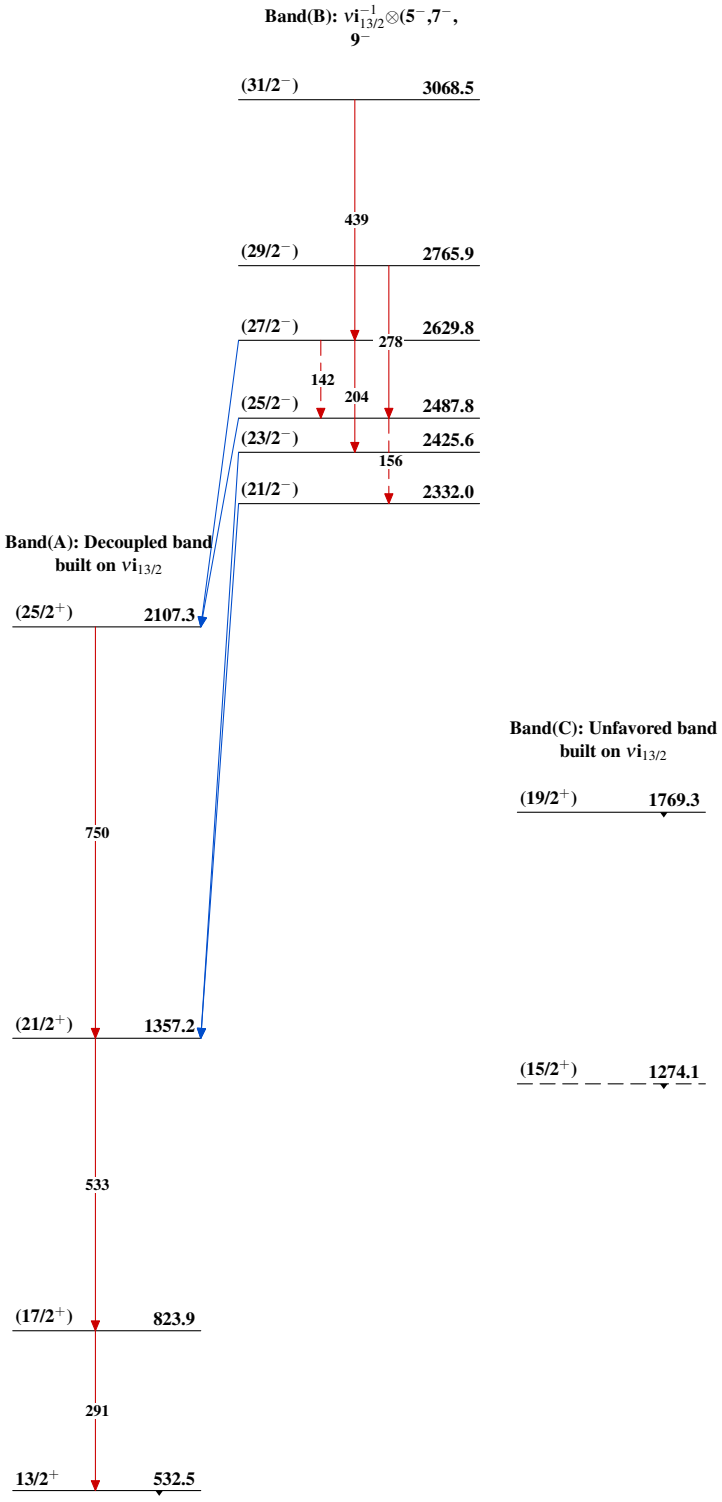
Legend

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



$^{199}_{80}Hg_{119}$

^{198}Pt(α,3nγ) 1974Pr09,1978Me11



$^{199}_{80}Hg_{119}$