^{202}Hg(α,3nγ) 1988Ro08,1977Sa18,1986Ja21

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 177, 509, 2021	4-Jul-2021

1988Ro08: E(α)=53 MeV; Target: enriched liquid mercury with a thickness of ≈200 mg/cm^2; Detectors: Ge and Ge(Li); Measured: Eγ, Iγ, $\gamma(\theta)$, $\gamma(\theta$,H,t), $\gamma\gamma$(t), $\gamma\gamma$ coin; Deduced: J^π, $T_{1/2}$, g-factor, configurations.

1977Sa18: E(α)=38.2 MeV; Target: enriched liquid mercury with a thickness of ≈200 mg/cm^2; Detectors: three Ge; Measured: Eγ, Iγ, $\gamma(\theta$,H,t); Deduced: J^π, $T_{1/2}$, g-factor, configurations.

1986Ja21: E(α)=41 MeV; Target: enriched up to 77% in ^{202}Hg; Detectors: Ge(Li); Measured: Eγ, Iγ, γ(t), $\gamma\gamma$ coin; Deduced: J^π, $T_{1/2}$, configurations.

^{203}Pb Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0[#]	5/2$^-$		
126.8[&] *4*	1/2$^-$		
186.7[a] *4*	3/2$^-$		
595.9[@] *4*	3/2$^-$		
820.3[@] *5*	7/2$^-$		
824.9[b] *5*	13/2$^+$		
867.0[@] *4*	5/2$^-$		
896.8[@] *5*	9/2$^-$		
933.3 *4*	5/2$^-$		
1161.2 *7*	7/2$^-$		
1641.2 *7*	11/2$^+$		
1663.2[c] *7*	17/2$^+$		
1921.4[d] *8*	21/2$^+$	42 ns *3*	$T_{1/2}$: From $\gamma\gamma$(t) in 1977Sa18 using time spectrum produced by gating on the 258.2γ (below the isomer) and 239.6γ and 873.6γ (above the isomer) Other: 56 ns *1* from 258.2γ(t) and 838.3γ(t) in 1986Ja21. This value is assumed to be less accurate given the possible contribution from the J^π=(25/2$^-$) isomer ($T_{1/2}$=122 ns *4*). g-factor=−0.061 *2* (1986Ja21) using in-beam time differential perturbed angular distribution technique. However, there is a possible contribution from the J^π=(25/2$^-$) isomer ($T_{1/2}$=122 ns *4*).
1943.3[d] *8*	19/2$^+$		
2117.6 *8*	19/2$^+$		
2160.9 *9*	21/2$^+$		
2794.9[e] *8*	23/2$^+$		
2922.8 *10*	21/2$^-$		
2922.8+x[g]	25/2$^-$	122 ns *4*	Additional information 1. E(level): Based on the observed delayed component for the 979.5γ, but no direct decay to the J^π=(21/2$^-$) level is observed. $T_{1/2}$: From 280γ(t) and 979γ(t) in 1988Ro08. g-factor=−0.059 *3* (1988Ro08) using in-beam time differential perturbed angular distribution technique.
2948.0[f] *9*	29/2$^-$	480 ms *7*	$T_{1/2}$: From Adopted Levels. Other: 480 ms *40* from γ(t) in 1977Sa18.
3688.7[i] *10*	31/2$^-$		
3909.1[i] *10*	33/2$^-$		
4053.4 *10*	31/2$^-$		
4456.2[h] *10*	33/2$^+$		
5024.5[j] *11*	37/2$^+$		
5295.5 *12*			
5570.5 *12*			

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^{202}Hg(α,3nγ) 1988Ro08,1977Sa18,1986Ja21 (continued)

^{203}Pb Levels (continued)

† From a least-squares fit to Eγ and by assuming ΔEγ=0.5 keV.
‡ From 1988Ro08.
# Dominant configuration: $\nu(f_{5/2}^{-1})$.
@ Dominant configuration: $\nu(f_{5/2}^{-1})\otimes 2^+$.
& Dominant configuration: $\nu(p_{1/2}^{-1})$.
a Dominant configuration: $\nu(p_{3/2}^{-1})$.
b Dominant configuration: $\nu(i_{13/2}^{-1})$.
c Dominant configuration: $\nu(i_{13/2}^{-1})\otimes 2^+$.
d Dominant configuration: $\nu(i_{13/2}^{-1})\otimes 4^+$.
e Dominant $\nu(p_{1/2}^{-1},f_{5/2}^{-3},f_{7/2}^{-1},i_{13/2}^{-2})$ with $\nu(f_{5/2}^{-1},f_{7/2}^{-1},i_{13/2}^{-2})\otimes 2^+$ admixtures.
f Configuration=$\nu(f_{5/2}^{-1},i_{13/2}^{-2})$.
g Configuration=$\nu(p_{1/2}^{-1},i_{13/2}^{-2})$.
h Configuration: $\nu(i_{13/2}^{-3})$.
i Configuration: $\nu(f_{5/2}^{-1},i_{13/2}^{-2})\otimes 2^+$.
j Configuration: $\nu(i_{13/2}^{-3})\otimes 2^+$.

γ(^{203}Pb)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Iγ(delayed)‡	Comments
(21.8)		1943.3	19/2+	1921.4	21/2+			E_γ: Not observed directly, but required by the 979γ-258γ coincidence relationship in 1988Ro08.
126.7	2.6	126.8	1/2−	0	5/2−			
153.3	0.9	2948.0	29/2−	2794.9	23/2+	E3	57 *3*	E_γ: Other: 153.4 keV *2* (1977Sa18). Mult.: α(exp)=13.6 *15* (1977Sa18).
174.4	9.8	2117.6	19/2+	1943.3	19/2+	(M1)	13 *2*	E_γ: Other: 173.9 keV *3* (1977Sa18). Mult.: A_2=0.16 *6*, A_4=0.14 *8*; J to J transition.
186.7	3.3	186.7	3/2−	0	5/2−			A_2 < 0.
217.7	≈1	2160.9	21/2+	1943.3	19/2+		9 *2*	E_γ: Other: 217.4 keV *3* (1977Sa18). A_2 < 0.
x231.9 *3*	1.2 *1*						15 *2*	E_γ,I_γ: From 1977Sa18.
239.6	16.4	2160.9	21/2+	1921.4	21/2+	M1	129 *6*	E_γ: Other: 239.3 keV *2* (1977Sa18). Mult.: A_2=0.20 *6*, A_4=0.01 *8*; α(exp)=0.66 *18* (1977Sa18); J to J transition.
258.2	71.9	1921.4	21/2+	1663.2	17/2+	E2	824 *33*	E_γ: Other: 258.4 keV *1* (1977Sa18). Mult.: From adopted gammas. A_2=−0.01 *6*, A_4=0.04 *8*.
264.4	4	1161.2	7/2−	896.8	9/2−	M1		Mult.: A_2=−0.39 *5*, A_4=0.11 *8*.
271@	<1@	5295.5		5024.5	37/2+			
271.1@	≈1@	867.0	5/2−	595.9	3/2−			
280.0	13.1	1943.3	19/2+	1663.2	17/2+	M1	40 *5*	E_γ: Other: 280.2 keV *2* (1977Sa18). Mult.: A_2=−0.29 *5*, A_4=−0.17 *8*.
403.0	5.6	4456.2	33/2+	4053.4	31/2−	E1		Mult.: A_2=−0.15 *5*, A_4=0.01 *8*.
454.5	≈1	2117.6	19/2+	1663.2	17/2+		10 *2*	E_γ: Other: 453.8 keV *3* (1977Sa18). A_2 < 0.
546@	≈1@	5570.5		5024.5	37/2+			
547	3.8	4456.2	33/2+	3909.1	33/2−	(E1)		Mult.: A_2=0.12 *4*, A_4=−0.15 *6*; J to J transition.
568.3	8.8	5024.5	37/2+	4456.2	33/2+	E2		Mult.: A_2=0.27 *9*, A_4=0.31 *9*.
596.0	≈5	595.9	3/2−	0	5/2−			A_2=−0.11 *5*, A_4=0.27 *8*.
634.2	7.3	2794.9	23/2+	2160.9	21/2+	M1	211 *11*	E_γ: Other: 634.5 keV *2* (1977Sa18). Mult.: A_2=−0.08 *6*, A_4=0.31 *8*.

^{202}Hg(α,3nγ) 1988Ro08,1977Sa18,1986Ja21 (continued)

γ(^{203}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	Iγ(delayed)‡	Comments
677.3	3.2	2794.9	23/2+	2117.6	19/2+		37 *4*	E_γ: Other: 678.1 keV *2* (1977Sa18). A_2≈0.
740.1	≈2.5	867.0	5/2−	126.8	1/2−			
740.5	8	3688.7	31/2−	2948.0	29/2−	M1		Mult.: A_2=−0.70 *4*, A_4=0.22 *7*.
746.6	4	933.3	5/2−	186.7	3/2−			A_2 < 0.
767.4	4.1	4456.2	33/2+	3688.7	31/2−	E1		Mult.: A_2=−0.25 *5*, A_4=0.34 *7*.
816.3	3.7	1641.2	11/2+	824.9	13/2+			A_2 < 0.
820.3	7.5	820.3	7/2−	0	5/2−	M1		Mult.: A_2=−0.05 *7*, A_4=−0.54 *9*.
824.9	82.8	824.9	13/2+	0	5/2−			E_γ: Other: 825.1 keV *1* (1977Sa18). A_2=−0.00 *5*.
838.3	100	1663.2	17/2+	824.9	13/2+	E2	1000	E_γ: Other: 838.5 keV *1* (1977Sa18). Mult.: A_2=0.11 *6*, A_4=0.03 *8*.
851.3	≈3	2794.9	23/2+	1943.3	19/2+		45 *4*	E_γ: Other: 851.9 keV *3* (1977Sa18).
867.0	9.6	867.0	5/2−	0	5/2−			A_2=−0.36 *6*, A_4=−0.12 *8*.
873.6	23.2	2794.9	23/2+	1921.4	21/2+	M1	511 *23*	E_γ: Other: 873.8 keV *1* (1977Sa18). Mult.: A_2=−0.02 *5*, A_4=0.05 *8*.
896.8	3.2	896.8	9/2−	0	5/2−			A_2=0.83 *7*, A_4=0.15 *8*.
933.3	4	933.3	5/2−	0	5/2−			
961	≈6	3909.1	33/2−	2948.0	29/2−			
979.5	6.6	2922.8	21/2−	1943.3	19/2+	D		Mult.: A_2=0.02 *6*, A_4=−0.04 *7*.
1026.5	6.5	2948.0	29/2−	1921.4	21/2+		153 *8*	E_γ: Other: 1027.0 keV *3* (1977Sa18).
1105.6	4.3	4053.4	31/2−	2948.0	29/2−	M1		Mult.: A_2=−1.21 *3*, A_4=−0.24 *8*.

† From 1988Ro08.
‡ From 1977Sa18.
# From $\gamma(\theta)$ in 1988Ro08 and α(exp) in 1977Sa18.
@ Multiply placed with undivided intensity.
x γ ray not placed in level scheme.

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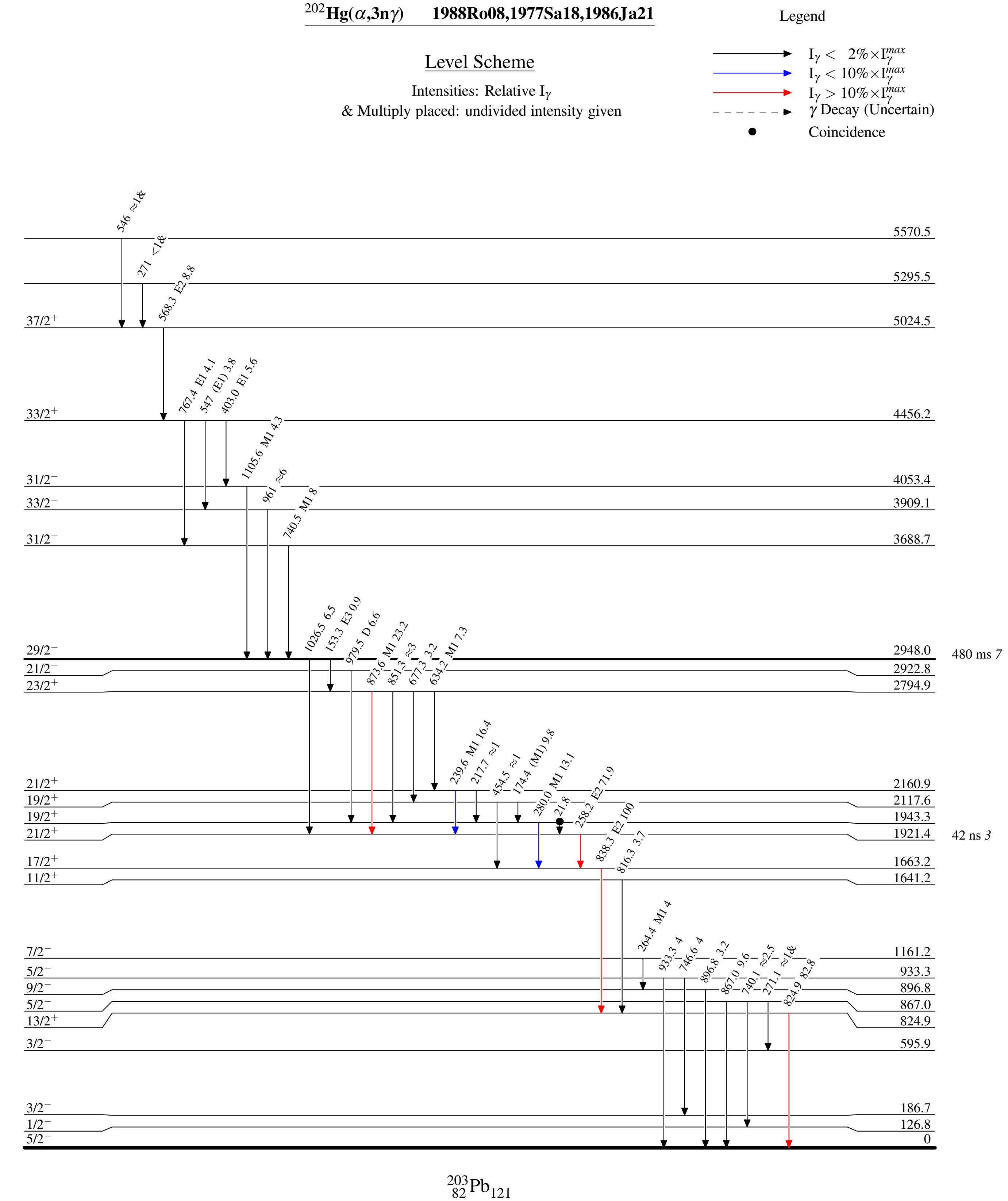
Level Scheme

Intensities: Relative I_γ

& Multiply placed: undivided intensity given



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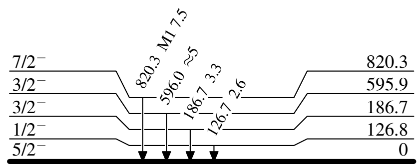
Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



$^{203}_{82}Pb_{121}$