^{199}Hg(n,γ) E=th:primary 1971Ma10,1970Or05,1967Sc30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 192,1 (2023)	1-Aug-2023

J^π(^{199}Hg)=1/2$^-$.
1971Ma10: Munich 4 MW reactor; natural HgS target; ce measurements using γ spectrometer.
1970Or05: MIT thermal capture γ-ray facility; natural Hg target; 30 cm^3 Ge(Li) spectrometer, two 6-in by 3-in thick NaI detectors.
1967Sc30: BNL graphite reactor; 83.45% enriched target; Ge(Li) spectrometer.
Others: 2011Be36, 1974Sc33, 1967Ba20, 1967Ra06, 1964Se04, 1963Gr31.

^{200}Hg Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	E(level)[†]	J^π[‡]	E(level)[†]	J^π[‡]
0.0	0$^+$	stable	2228.9 *20*	1$^+$	3055.0 *13*	1$^+$
368.9 *13*	2$^+$		2276.0 *19*	(2)$^+$	3075.5 *13*	1$^+$
1030.2 *14*	0$^+$		2289.5 *14*	2$^+$	3187.3 *13*	1$^+$
1257.1 *13*	2$^+$		2295.8 *5*	1$^+$	3217.9 *13*	(2)$^+$
1572.2 *15*	1$^+$		2297.8 *13*	(1,2)$^-$	3230.0 *17*	(1)$^+$
1575.3 *14*	2$^+$		2345.5 *19*	1$^+$,2$^+$,3$^+$	3270.8 *13*	1$^+$
1594.9 *13*	2$^+$		2371.2 *11*	1$^+$	3290.5 *13*	1$^+$
1632.0 *12*	1$^+$		2463.7 *15*	(1$^+$)	3354.2 *13*	1$^+$
1641.7 *15*	2$^+$		2641.2 *11*	1$^+$	3454.3 *15*	(1)$^+$
1719.4 *12*	1$^+$		2693.4 *15*	(1,2)$^+$	3491.9 *19*	1$^+$
1733.4 *15*	2$^+$		2879.6 *13*	1$^+$	3570.9 *19*	1$^+$
2062.3 *11*	1$^+$		2895.0 *16*	(1,2)$^-$	3657.4 *15*	(1)$^+$
2187.7 *19*	1$^+$		2979.5 *11*	1$^+$	(8029.8 *11*)	0$^-$,1$^-$

† From a least-squares fit to Eγ.
‡ From Adopted Levels. The thermal n-capture is dominated by the J^π=0$^-$ state, and hence the primary γ-ray transitions are expected to populate preferentially J^π=1$^+$ states. The J^π=1$^-$ resonance n-capture component is proposed by 2011Be36 from $\gamma(\theta)$ and the population of 2$^+$ states.

γ(^{200}Hg)

Iγ normalization: 98.04% *12* of thermal n-capture on natural mercury is due to capture on ^{199}Hg (2018MuZY).

E_γ[†]	I_γ[ad]	E_i(level)	Mult.[c]	Comments
^{x}3352.8 *15*	0.64 *13*		M1,E2	Mult.: α(K)exp=0.00060 *12*, α(L)exp=0.00020 *7*.
^{x}3500.2 *10*	0.40 *8*		E1	Mult.: α(K)exp=0.00020 *12*.
^{x}3601.5[‡] *10*	0.19 *4*			
^{x}3633.4 *10*	0.54 *11*		E1	Mult.: α(K)exp=0.00039 *10*.
^{x}3750.3 *10*	0.26 *5*		E1	Mult.: α(K)exp=0.00022 *8*.
^{x}3828.3 *10*	0.4[b]		E1,M1,E2	Mult.: α(K)exp=0.00048.
^{x}3841.0 *10*	0.22 *4*		M1,E2	Mult.: α(K)exp=0.00063.
^{x}3869.1 *15*	0.51 *10*		E1	Mult.: α(K)exp=0.00021 *7*.
^{x}3891.8[‡] *10*	0.20 *4*			
^{x}3952.3 *15*	0.57 *11*		E1	Mult.: α(K)exp=0.00017 *7*.
^{x}4018.4 *15*	0.22[b] *9*			Mult.: α(K)exp=0.00037 *15*.
^{x}4072 *2*	0.18[b]		E1,M1,E2	Mult.: α(K)exp=0.00030.
^{x}4094.9[‡] *10*	0.32 *6*		E1	Mult.: α(K)exp=0.00015.
^{x}4119.3 *11*	0.63 *13*		E1	Mult.: α(K)exp=0.00015 *5*.
^{x}4176.1 *20*	0.27[b] *8*		E1	Mult.: α(K)exp=0.00020 *8*.

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^{199}Hg(n,γ) E=th:primary 1971Ma10,1970Or05,1967Sc30 (continued)

γ(^{200}Hg) (continued)

Eγ[†]	Iγ[ad]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[c]	Comments
[x]4245.6 20	0.26 5					E1	Mult.: α(K)exp=0.00017 8.
[x]4273.2 10	0.53 11					M1,E2,E1	Mult.: α(K)exp=0.00032 8.
[x]4326[@] 8							
[x]4351.2[‡] 10	0.27 6						
4372.3[‡] 10	0.59 12	(8029.8)	0⁻,1⁻	3657.4	(1)⁺	E1	Mult.: α(K)exp=0.00021 4.
4458.8 15	0.23 5	(8029.8)	0⁻,1⁻	3570.9	1⁺	E1	Mult.: α(K)exp=0.00017 4.
4537.8 15	0.25 5	(8029.8)	0⁻,1⁻	3491.9	1⁺	E1	Mult.: α(K)exp=0.00018 5.
[x]4555.5 15	0.31 6					E1	Mult.: α(K)exp=0.00014 5.
4575.4 10	1.0 2	(8029.8)	0⁻,1⁻	3454.3	(1)⁺	E1	Mult.: α(K)exp=0.00016 3.
[x]4604.1[‡] 10	0.26 5						
4675.5 7	3.0 6	(8029.8)	0⁻,1⁻	3354.2	1⁺	E1	Mult.: α(K)exp=0.00018 2.
4739.2 6	7.3 15	(8029.8)	0⁻,1⁻	3290.5	1⁺	E1	Mult.: α(K)exp=0.00016 2.
4758.9 6	3.3 6	(8029.8)	0⁻,1⁻	3270.8	1⁺	E1	Mult.: α(K)exp=0.00016 2.
4799.7 12	0.21 4	(8029.8)	0⁻,1⁻	3230.0	(1)⁺	(E1)	Mult.: α(K)exp=0.00013 4; doublet with 4811.8γ.
4811.8 6	0.85 17	(8029.8)	0⁻,1⁻	3217.9	(2)⁺	E1	Mult.: α(K)exp=0.00013 4; doublet with 4799.7γ.
4842.4 6	5.1 10	(8029.8)	0⁻,1⁻	3187.3	1⁺	E1	Mult.: α(K)exp=0.00016 2; α(L)exp=0.00002 1.
4954.2 7	1.1 2	(8029.8)	0⁻,1⁻	3075.5	1⁺	E1	Mult.: α(K)exp=0.00010 3.
4974.7 7	1.2 3	(8029.8)	0⁻,1⁻	3055.0	1⁺	E1	Mult.: α(K)exp=0.00014 2.
5050.16[&] 9	5.1 10	(8029.8)	0⁻,1⁻	2979.5	1⁺	E1	Mult.: α(K)exp=0.00015 2; α(L)exp=0.00002 1.
5134.7 11	0.12[b]	(8029.8)	0⁻,1⁻	2895.0	(1,2)⁻	M1,E2	Mult.: α(K)exp=0.00020.
5150.1 7	0.42 8	(8029.8)	0⁻,1⁻	2879.6	1⁺	E1	Mult.: α(K)exp=0.00015 4.
5336.3[#] 10		(8029.8)	0⁻,1⁻	2693.4	(1,2)⁺		
5388.52[&] 8	3.8 8	(8029.8)	0⁻,1⁻	2641.2	1⁺	E1	Mult.: α(K)exp=0.00013 2, α(L)exp=0.000025 5, α(M)exp=0.000012 5.
5566.0[‡] 10	0.24 5	(8029.8)	0⁻,1⁻	2463.7	(1⁺)	(E1)	Mult.: α(K)exp=0.00020.
5658.52[&] 6	6.2 12	(8029.8)	0⁻,1⁻	2371.2	1⁺	E1	Mult.: α(K)exp=0.00013 2.
5684.2[#] 15		(8029.8)	0⁻,1⁻	2345.5	1⁺,2⁺,3⁺		
5731.9 7	0.41 8	(8029.8)	0⁻,1⁻	2297.8	(1,2)⁻	M1,E2	Mult.: α(K)exp=0.00027 14.
5740.2[#] 8		(8029.8)	0⁻,1⁻	2289.5	2⁺		
5753.7[#] 15		(8029.8)	0⁻,1⁻	2276.0	(2)⁺		
5800.8 16	0.12[b] 3	(8029.8)	0⁻,1⁻	2228.9	1⁺	(E1)	Mult.: α(K)exp=0.00026.
5842.0[#] 15		(8029.8)	0⁻,1⁻	2187.7	1⁺		
5967.35[&] 7	14.0 28	(8029.8)	0⁻,1⁻	2062.3	1⁺	E1	Mult.: α(K)exp=0.00011 1, α(L)exp=0.000017 2, α(M)exp=0.00003 3.
6296.3[#] 10		(8029.8)	0⁻,1⁻	1733.4	2⁺		
6310.3 5	0.72 14	(8029.8)	0⁻,1⁻	1719.4	1⁺	E1	Mult.: α(K)exp=0.00012 6.
6388.0[#] 10		(8029.8)	0⁻,1⁻	1641.7	2⁺		
6397.7 5	0.80 16	(8029.8)	0⁻,1⁻	1632.0	1⁺	E1	Mult.: α(K)exp=0.00013 3.
6434.8[#] 6		(8029.8)	0⁻,1⁻	1594.9	2⁺		
6454.4[#] 8		(8029.8)	0⁻,1⁻	1575.3	2⁺		
6457.5[‡] 10	5.2 10	(8029.8)	0⁻,1⁻	1572.2	1⁺	E1	Mult.: α(K)exp=0.00011 1, α(L)exp=0.000015 2, α(M)exp=0.00006 3.
6772.5[#] 6		(8029.8)	0⁻,1⁻	1257.1	2⁺		
6999.4[#] 8		(8029.8)	0⁻,1⁻	1030.2	0⁺		Eγ: Most likely depopulates the J^π=1⁻ resonance state.

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^{199}Hg(n,γ) E=th:primary 1971Ma10,1970Or05,1967Sc30 (continued)

γ(^{200}Hg) (continued)

E_γ[†]	I_γ[ad]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	Comments
7660.7 *6*	0.053[b] *11*	(8029.8)	$0^-,1^-$	368.9	2^+	(E1)	Mult.: α(K)exp=0.0003.
8029.6 *11*	0.020[b] *6*	(8029.8)	$0^-,1^-$	0.0	0^+		E_γ: Most likely depopulates the $J^\pi=1^-$ resonance state. Mult.: α(K)exp<0.0013.

[†] From 1967Sc30, unless otherwise stated.
[‡] From 1970Or05.
[#] From 2011Be36.
[@] From 1971Ma10.
[&] From 1979Br21.
[a] From 1970Or05 (photons per 100 n-captures in natural Hg), unless otherwise stated.
[b] From 1967Sc30.
[c] From α(K)exp, α(L)exp and α(M)exp in 1971Ma10. Internal pair production studied by 1974Sc33.
[d] For intensity per 100 neutron captures, multiply by 0.9804 *12*.
[x] γ ray not placed in level scheme.

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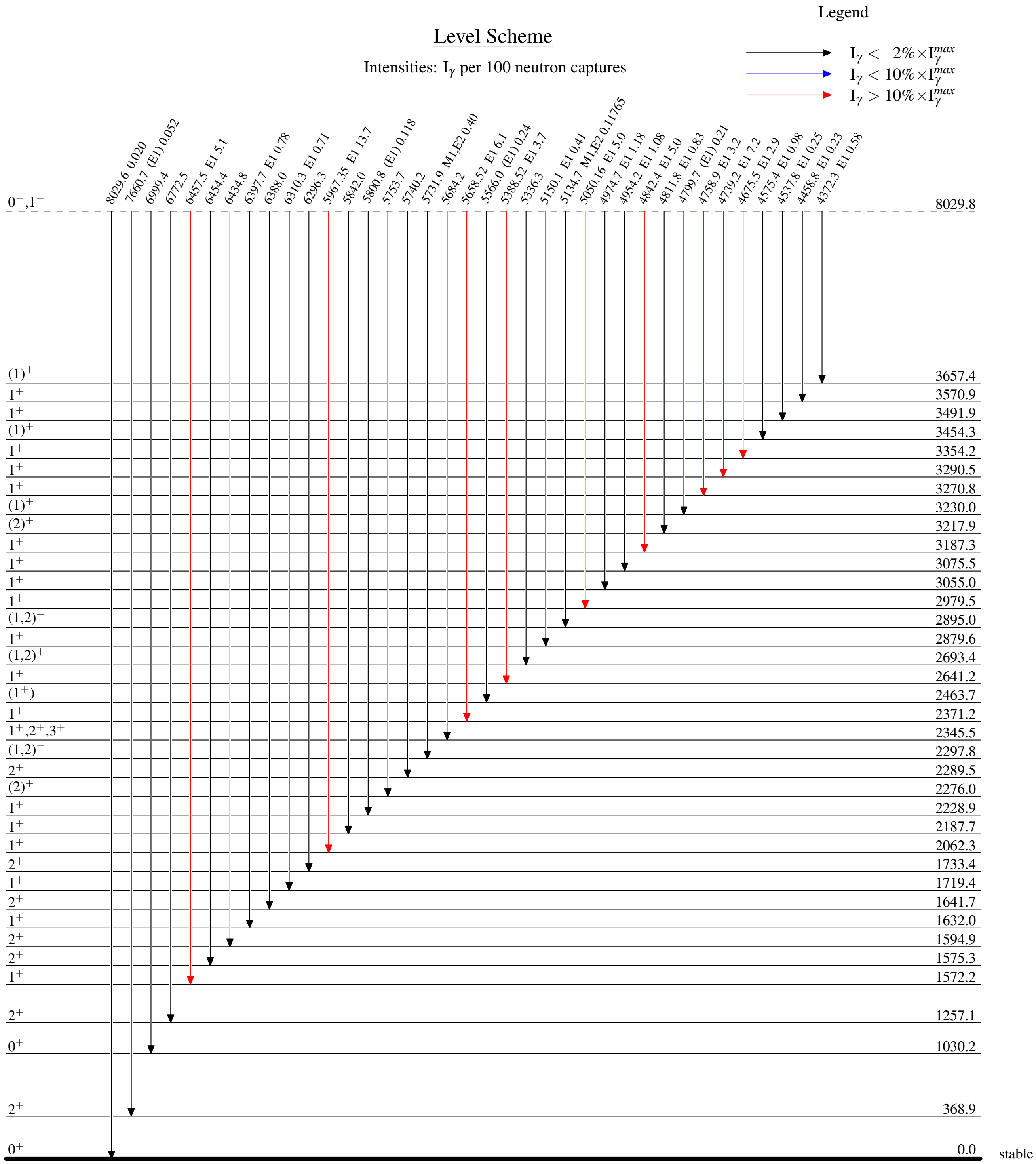

$^{200}_{80}Hg_{120}$