^{198}Au IT decay (2.272 d) 1972Cu06,1973Pa08,1975Ma30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huang Xiaolong and Kang Mengxiao	NDS 133, 221 (2016)	1-Dec-2015

Parent: ^{198}Au: E=811.7 *15*; J$^{\pi}$=(12^{-}); T$_{1/2}$=2.272 d *16*; %IT decay=100.0

Sources produced by ^{200}Hg(d,α) (1972Cu06), ^{197}Au(d,p) (1968Bo30,1973Pa08), ^{198}Hg(n,p) (1973Pa08), ^{196}Pt(α,pn) (1975Ma30), ^{198}Pt(d,2n) (1975Ma30), and ^{197}Au(n,γ) (1990Pi08). ^{200}Hg(d,α) E=18 MeV (1972Cu06), chem.; ^{197}Au(d,p) E=12.5 MeV (1968Bo30,1973Pa08); ^{198}Hg(n,p) E=14.5 MeV (1973Pa08), chem.; ^{196}Pt(α,pn) E=35 MeV, ^{198}Pt(d,2n) E=18 MeV (1975Ma30), chem.

^{197}Au(d,pγ) γ(t) (1968Bo30) prompt and delayed γ spectra.

Level scheme is consistent with $\gamma\gamma$(t) spectra (1972Cu06,1973Pa08).

^{198}Au Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[@]	Comments
0.0	2^{-}	2.6941 d *2*	
214.89 *5*	4^{-}		
312.10 *7*	5^{+}	124 ns *4*	
516.20? *10*	6^{+}[#]		E(level): Order of 180γ-204γ cascade is tentative; alternatively, E(level)=492.4, J$^{\pi}$=(7^{+}).
(645.92 *17*)			E(level): Possible a proposed 646 level could resolve intensity imbalance at the 312 level. It could be fed directly from the isomer, or via a low-energy transition from 696-level. The latter is more likely, and would suggest I(γ+ce)(115.2γ)=100. Neither author would have seen a highly converted 50γ connecting the 696 and the possible 646 level. Unplaced 333.82γ could be placed between 646 and 312 levels.
696.51 *11*	8^{+}[#]		
811.7 *15*	(12^{-})[#]	2.272 d *16*	%IT=100 μ=(+)5.85 *9* (2005St24) μ from NMR/ON (2005St24). No β^{-} or ε branching observed (1972Cu06,1973Pa08).

† From decay scheme, using least-squares fit to Eγ values.
‡ From Adopted Levels, except as noted.
# From analogy with ^{196}Au.
@ From Adopted Levels.

γ(^{198}Au)

Iγ normalization: No β^{-} or ε decay observed and I(γ+ce)(to g.s.)=100.

K x-ray Intensities (1990Pi08)

Radiations	E,keV[a]	Intensities[b]
Kα_1 x-ray	68.8037 *8*	47
Kα_2 x-ray	66.9895 *8*	28
Kβ x-ray	78.00	21.4

a Calculated values
b Measured values per 100 decays (1990Pi08)

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γ(^{198}Au) (continued)

E_γ[†]	I_γ[‡&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[a]	$I_{(\gamma+ce)}$[&]	Comments
(50.5)		696.51	8+	645.92?				29 6	50.5γ would not have been seen experimentally since it is expected to have a large conversion coefficient. $I_{(\gamma+ce)}$: From I(γ+ce) value of 333.82γ.
97.21 5	89 6	312.10	5+	214.89	4−	E1[@]	0.445		α(K)=0.356 5; α(L)=0.0684 10; α(M)=0.01594 23; α(N+..)=0.00460 7
115.2 15	0.052 5	811.7	(12−)	696.51	8+	(M4)	2.49×10^3 22		α(K)=185 5; α(L)=1620 150; α(M)=530 50; α(N+..)=160 15 E_γ: From 1973Pa08. I_γ: From I(γ+ce) and α. Iγ(exp)<1.5 (1973Pa08). ce(L)=99 14, α(L)=1670 (1973Pa08). Mult.: M3, M4, E4 from α(L)exp>56; M3 ruled out from no evidence of ce(K); B(M4)(W.u.)=0.31 is consistent with B(M4)(W.u.)=0.24 (^{196}Au), 0.48 (^{195}Au), 0.25 (^{198}Tl).
180.31 5	64 6	696.51	8+	516.20?	6+	E2	0.537		α(K)=0.219 3; α(L)=0.239 4; α(M)=0.0616 9; α(N+..)=0.01767 25 α(K)exp=0.20 7; also γ anisotropy Iγ(θ,t) (1975Ma30).
204.10 6	50 6	516.20?	6+	312.10	5+	M1[@]	0.959		α(K)=0.789 11; α(L)=0.1311 19; α(M)=0.0304 5; α(N+..)=0.00906 13 α(K)exp=0.83 15. Mult.: M1+(E2) from γ anisotropy Iγ(θ,t) in Ni (1975Ma30) with δ=−0.10 5.
214.89 5	100	214.89	4−	0.0	2−	E2	0.294		α(K)=0.1421 20; α(L)=0.1140 16; α(M)=0.0292 4; α(N+..)=0.00839 12 Mult.: From K:L1:L2:L3:M=100 5:7 3:45 4:23 5:18 3 (1966Eg01) in (n,γ).
333.82 15	23 5	(645.92)		312.10	5+	M1	0.248		α(K)=0.205 3; α(L)=0.0337 5; α(M)=0.0078 1; α(N+..)=0.0019 3 α(K)exp<0.3. Mult.: Dipole with ΔJ=+1 from γ anisotropy Iγ(θ,t) (1975Ma30).

† From 1972Cu06 (semi), except as noted.
‡ Relative intensity normalized to Iγ(214.89γ)=100. Values are from 1973Pa08.
# Deduced from α(K)exp=ce(K)/Iγ (1973Pa08) normalized to α(K)(215γ)=0.142 (E2 theory), except as noted.
@ From Adopted Gamma radiations.

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γ(^{198}Au) (continued)

[&] For absolute intensity per 100 decays, multiply by 0.77 *1*.
[a] 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.