^{194}Au IT decay (600 ms) 1977Pa20,1975Ya14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 177, 1 (2021)	3-Sep-2021

Parent: ^{194}Au: E=107.4 *5*; J^π=(5$^+$); $T_{1/2}$=600 ms *8*; %IT decay=100.0

1977Pa20: isomers were produced via ^{195}Pt(p,2nγ) with 12-20 MeV protons from the internal slow-pulsing system of the 90-cm MC-20 cyclotron at University of Jyvaskyla on a target 11 mg/cm^2 97.3% enriched ^{195}Pt. γ rays were detected with Ge(Li) and HPGe detectors; conversion electrons were detected with a cooled silicon surface-barrier detector. Measured Eγ, Iγ, $\gamma\gamma$-coin, γ(t), $\gamma(\theta)$, E(ce), I(ce). Deduced levels, J, π, conversion coefficients, multipolarities. 1977Pa20 also report Iγ data from ^{194}Pt(p,nγ).

1975Ya14: isomers were produced via ^{194}Pt(d,2nγ) with 11, 13, 15 MeV deuterons and ^{194}Pt(p,nγ) with 11 MeV protons from the ANL accelerator. Natural and enriched Pt targets. γ rays were detected with Ge detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, γ(t). Deduced levels, $T_{1/2}$ of isomers.

1982Ne05: isomers were produced via ^{193}Ir(α,3nγ) with α beam from the Julich isochronous cyclotron JULIC on enriched ^{193}Ir target. Measured Eγ, Iγ, γ(t) with a Ge(Li) detector and measured conversion electrons with an iron-free on-line electron spectrometer of the orange type in the off-beam slow pulsing mode. Deduced isomer $T_{1/2}$, J, π, γ-ray multipolarities.

Others: 1980RoZN.

^{194}Au Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	1$^-$		
35.22 *7*	(2)$^-$		
80.51 *10*	(3)$^-$		
107.4 *5*	(5$^+$)	600 ms *8*	$T_{1/2}$: from γ(t) (1975Ya14). Other: 600 ms *50* (1982Ne05).

[†] From a least-squares fit to γ-ray energies.
[‡] From Adopted Levels.

$\gamma(^{194}Au)$

Iγ normalization: From I(γ+ce)(45.29γ)=100.

1980RoZN report γ rays at 10.9, 56.3 and 80.9, not seen by 1977Pa20, 1975Ya14 or 1982Ne05. These have been omitted.

Eγ	Iγ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[#]	Comments
26.9 *5*	0.24 *3*	107.4	(5$^+$)	80.51	(3)$^-$	(M2)	7.5×10^3 *7*	α(L)=5.5×10^3 *6*; α(M)=1.50×10^3 *14* α(N)=3.8×10^2 *4*; α(O)=67 *7*; α(P)=3.3 *3* %Iγ=0.0133 *21* Eγ: from ce data in 1977Pa20. Iγ: from ce(L)(26.9γ)/ce(L)(45.3γ)=1.03 *13* (1977Pa20) and mult=M2. Others: 0.24 *5* from I(γ+ce) balance at 80 level, <0.5 from γ-ray measurements (1977Pa20). Mult.: α(L)exp>2400 (1977Pa20) rules out mult=D,E2. The intensity balance at 80.5 level restricts multipolarity to M2, E3, M3 or M4. The upper limits on B(EL)(W.u.) rule out M4. The M3 is less likely since B(M3)(W.u.)=9.1 is very close to RUL=10 for M3. The M2 assignment is chosen simply because of preference of 5$^+$ for 107-keV isomer rather than 6$^+$. A similar 5$^+$ isomer reported in ^{192}Au (1977Pa20).

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^{194}Au IT decay (600 ms) 1977Pa20,1975Ya14 (continued)

$\gamma(^{194}Au)$ (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
35.22 *7*	42 *4*	35.22	$(2)^-$	0.0	1^-	M1+E2	0.14 *4*	41 *9*	α(L)=31 *7*; α(M)=7.5 *16* α(N)=1.9 *4*; α(O)=0.32 *7*; α(P)=0.0151 *3* %Iγ=2.3 *3* E_γ: weighted average of 35.19 *7* (1977Pa20) and 35.27 *8* (1975Ya14). I_γ: from 1977Pa20. Other: 80 *23* from 1975Ya14. Mult.,δ: from α(L)exp=32 *5* (1977Pa20).
45.29 *7*	100	80.51	$(3)^-$	35.22	$(2)^-$	M1+E2	0.144 *30*	17.0 *18*	α(L)=13.0 *13*; α(M)=3.1 *4* α(N)=0.77 *9*; α(O)=0.137 *14*; α(P)=0.00715 *12* %Iγ=5.6 *6* E_γ: weighted average of 45.32 *7* (1977Pa20) and 45.25 *9* (1975Ya14). Mult.,δ: from α(L)exp=13.4 *12* (1977Pa20).

[†] From ce data, normalized to ce(L) data for 128.6γ from ^{194}Au IT decay (420 ms). The 128.6γ treated as E2 with α(L)=1.08.
[‡] For absolute intensity per 100 decays, multiply by 0.0556 *56*.
[#] 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.

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