^{202}Au β^- decay 1984Cr01,1972Pa06

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 196,342 (2024)	1-Sep-2023

Parent: ^{202}Au: E=0; $J^\pi=(1^-)$; $T_{1/2}$=28.4 s *12*; Q(β^-)=2992 *23*; %β^- decay=100

1984Cr01: ^{202}Au produced using the ^{202}Hg(n,p) reaction. E(n)=14 MeV; ^{nat}Hg target with a thickness of 32 g. Detectors: Ge and Ge(Li). Measured: Eγ, $\gamma\gamma$ coin, γ(t).

1972Pa06: ^{202}Au produced using ^{202}Hg(n,p) reaction. E(n)=14-15 MeV; ^{nat}Hg target with a thickness of up to 10 g. Detectors: Ge(Li), NaI(Tl), plastic scintillation detector. Measured: Eγ by Ge(Li), $\gamma\gamma$ coin by NaI(Tl)-Ge(Li), $\beta\gamma$ coin by plastic-Ge(Li).

Others: 1967Wa23, 1972Bu05.

^{202}Hg Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]
0.0	0^+	
439.512 *8*	2^+	27.35 ps *23*
959.94 *7*	2^+	13.5 ps *28*
1347.92 *7*	$(1^+,2^+)$	
1411.36 *13*	0^+	
1564.72 *8*	0^+	
1643.62 *10*	0^+	
1745.90 *8*	$1,2^+$	
1851.7? *4*	2^+	
1959.0? *4*	$1,2^+$	

[†] From a least-squares fit to Eγ.
[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(1033[‡] *23*)	1959.0?	≈0.096	≈6.6	av Eβ=342.3 *89*
(1140[‡] *23*)	1851.7?	≈0.095	≈6.7	av Eβ=384.0 *91*
(1246 *23*)	1745.90	≈2.61	≈5.4	av Eβ=425.8 *92*
(1348 *23*)	1643.62	≈1.86	≈5.7	av Eβ=466.7 *93*
(1427 *23*)	1564.72	≈2.13	≈5.7	av Eβ=498.6 *94*
(1581 *23*)	1411.36	≈0.69	≈6.4	av Eβ=561.2 *95*
(1644 *23*)	1347.92	≈2.68	≈5.9	av Eβ=587.4 *96*
(2032 *23*)	959.94	≈0.5	≈7.0	av Eβ=749.9 *98*
(2992 *23*)	0.0	≈90	≈5.4	av Eβ=1163 *10*
				E(decay): 3500 *200* keV (1967Wa23), 2700 keV *300* (1972Bu05) and ≈3300 keV (1972Pa06).
				Iβ^-: From 1967Wa23.

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

^{202}Au β^- decay 1984Cr01,1972Pa06 (continued)

$\gamma(^{202}Hg)$

Iγ normalization: Deduced using ΣI(γ+ce)[g.s.]≈10%, based on Iβ⁻≈90% (1967Wa23).

E_γ [†]	I_γ [‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [†]	δ	α [#]	Comments
388.0 *1*	9.3 *12*	1347.92	(1⁺,2⁺)	959.94	2⁺	(M1+E2)		0.12 *6*	α(K)=0.09 *6*; α(L)=0.019 *6*; α(M)=0.0045 *12* α(N)=0.00112 *31*; α(O)=2.1×10⁻⁴ *6*; α(P)=1.3×10⁻⁵ *8* %Iγ≈0.85 I_γ: From Iγ(388.0γ)/Iγ(908.39γ)=0.50 *6* in adopted.
439.56 *1*	100 *5*	439.512	2⁺	0.0	0⁺	E2		0.0371 *5*	α(N)=0.000526 *7*; α(O)=9.29×10⁻⁵ *13*; α(P)=3.42×10⁻⁶ *5* %Iγ≈9.2 α(K)=0.0259 *4*; α(L)=0.00851 *12*; α(M)=0.002108 *30* E_γ: 439.54 keV *7* in 1984Cr01 and 439.56 keV *12* in 1972Pa06.
520.13 *7*	17.4 *31*	959.94	2⁺	439.512	2⁺	M1+E2	+0.9 *1*	0.0566 *34*	α(K)=0.0456 *29*; α(L)=0.0084 *4*; α(M)=0.00198 *8* α(N)=0.000497 *21*; α(O)=9.3×10⁻⁵ *4*; α(P)=6.3×10⁻⁶ *4* %Iγ≈1.6 E_γ: 520.3 keV *5* in 1984Cr01 and 520.3 keV *4* in 1972Pa06.
[x]654.9 *4*	33 *3*								%Iγ≈3.0 E_γ: Assigned in 1984Cr01 to both ^{202}Au and ^{204}Au decays, but may also be due to ^{203}Au decay.
786.0 *4*	5.1 *8*	1745.90	1,2⁺	959.94	2⁺				%Iγ≈0.47 E_γ: From 1984Cr01.
908.39 *8*	18.5 *9*	1347.92	(1⁺,2⁺)	439.512	2⁺	(M1+E2)		0.013 *6*	α(K)=0.011 *5*; α(L)=0.0019 *7*; α(M)=4.4×10⁻⁴ *17* α(N)=1.1×10⁻⁴ *4*; α(O)=2.0×10⁻⁵ *8*; α(P)=1.5×10⁻⁶ *7* %Iγ≈1.7 E_γ: From 1984Cr01. Other: 908.6 keV *4* in 1972Pa06.
960.1 *1*	2.4 *12*	959.94	2⁺	0.0	0⁺	E2		0.00654 *9*	α(K)=0.00524 *7*; α(L)=0.000996 *14*; α(M)=0.0002354 *33* α(N)=5.89×10⁻⁵ *8*; α(O)=1.088×10⁻⁵ *15*; α(P)=6.89×10⁻⁷ *10* %Iγ≈0.22 E_γ: 959.7 keV *7* in 1984Cr01 and 960 keV in 1972Pa06.
971.85 *13*	7.5 *6*	1411.36	0⁺	439.512	2⁺	[E2]		0.00638 *9*	α(K)=0.00512 *7*; α(L)=0.000969 *14*; α(M)=0.0002288 *32*

Continued on next page (footnotes at end of table)

^{202}Au β^- decay 1984Cr01,1972Pa06 (continued)

$\gamma(^{202}Hg)$ (continued)

E_γ [†]	I_γ [‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[#]	Comments
								α(N)=5.72×10^{-5} *8*; α(O)=1.058×10^{-5} *15*; α(P)=6.73×10^{-7} *9* %Iγ≈0.69 E_γ: From 1984Cr01. Placed by the evaluator based on (n,γ).
1125.20 *8*	23.0 *8*	1564.72	0$^+$	439.512	2$^+$	[E2]	0.00480 *7*	α(K)=0.00389 *5*; α(L)=0.000697 *10*; α(M)=0.0001637 *23* α(N)=4.09×10^{-5} *6*; α(O)=7.61×10^{-6} *11*; α(P)=5.09×10^{-7} *7*; α(IPF)=4.45×10^{-7} *6* %Iγ≈2.1 E_γ: From 1984Cr01. Other: 1125.4 keV *4* in 1972Pa06.
1204.1 *1*	20.1 *16*	1643.62	0$^+$	439.512	2$^+$	[E2]	0.00422 *6*	α(K)=0.00343 *5*; α(L)=0.000602 *8*; α(M)=0.0001410 *20* α(N)=3.53×10^{-5} *5*; α(O)=6.57×10^{-6} *9*; α(P)=4.48×10^{-7} *6*; α(IPF)=4.37×10^{-6} *6* %Iγ≈1.9 E_γ: 1203.7 keV *5* in 1984Cr01 and 1203.7 keV *4* in 1972Pa06.
1306.37 *8*	22.5 *7*	1745.90	1,2$^+$	439.512	2$^+$			%Iγ≈2.1 E_γ: From 1984Cr01.
1746.4 *5*	0.71 *25*	1745.90	1,2$^+$	0.0	0$^+$			%Iγ≈0.065 E_γ: From 1984Cr01.
1851.7[&] *4*	1.03 *30*	1851.7?	2$^+$	0.0	0$^+$			%Iγ≈0.095 E_γ: From 1984Cr01.
1959.0[&] *4*	1.05 *25*	1959.0?	1,2$^+$	0.0	0$^+$			%Iγ≈0.097 E_γ: From 1984Sr01. Assigned by the authors to both ^{202}Au and ^{204}Au decays, but may also be due to ^{203}Au decay.

[†] From adopted gammas, unless otherwise stated.
[‡] From 1984Cr01, unless otherwise stated.
[#] Additional information 1.
[@] For absolute intensity per 100 decays, multiply by ≈0.092.
[&] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays