Coulomb excitation 1988St16,1981Ve12,1971Mc14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huang Xiaolong, Zhou Chunmei	NDS 104, 283 (2005)	1-Jan-2002

^{197}Au(p,p′): E=6 MeV (1957El11), E=6.7-12.6 MeV (1961Co35), E=8-23 MeV (1989Du02).
^{197}Au(α,α'): E=15 MeV (1971FoZW).
^{197}Au(p,p′γ): E=3 MeV (1955Mc51,1958Mc02), 4 MeV (1958Ma36,1961Re02), 12.3 MeV (1989KaZX).
^{197}Au($\alpha,\alpha'\gamma$): E=10-14 MeV (1971Mc14).
^{197}Au(^{16}O,^{16}O′γ), E=52 MeV (1970Sh12), 42-45 MeV (1971Mc14), 10-24 MeV (1974Yo02), 45 MeV (1974Ul01).
^{197}Au(^{32}S,^{32}S′γ): E=64 MeV (1974Yo02).
^{197}Au(^{35}Cl,^{35}Cl′γ): E=120 MeV (1979Bo10), measured $T_{1/2}$ via recoil-distance Doppler shift.
^{197}Au(40Ar,^{40}Ar′γ): E=171 MeV (1981Ve12), measured $T_{1/2}$ by RDM with Ge(Li).
^{197}Au(^{58}Ni,^{58}Ni′γ): E=175, 220 MeV (1988St16,1988St09), measured $\gamma(\theta$,H,t), (particle)γ-coin, $T_{1/2}$ by using Doppler-broadened lineshape technique, B(M1) and B(E2).
^{197}Au(^{63}Cu,^{63}Cu′γ): E=180 MeV (1986Ba19), measured $\gamma(\theta$,H).
Others: 1988Li20, 1988Su08, 1988We11, 1987St14, 1954Co55, 1954Go41, 1955Be19, 1955St57, 1969PrZV, 1989Ko17.

^{197}Au Levels

1988St16, 1971Mc14, 1979Bo10 compare B(E2) and B(M1) (exp vs theory) using the weak-coupling core-excitation model of 1961De37; 1979Bo10 postulate a d3/2 proton hole coupled to a ^{198}Hg core.

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0[@]	3/2$^+$	stable[@]	g=+0.097 (1988St16,1988St09)
77.350 *10*	1/2$^+$		g=+0.839 *6* (1988St16,1988St09) $T_{1/2}$: 1.91 ns *2* (+0 Au), 1.97 ns *8* (+10 Au) (1974Ul01). $T_{1/2}$(neutral atom Au)/$T_{1/2}$(10$^+$ Au)=0.95 *10* (1974Yo02). B(E2)=0.130 *7* (1971FoZW), B(E2)/(1+α)=0.0231 *17* (1974Yo02). B(E2): for α=4.23 *7*, δ=−0.35 *1* B(E2) values lead to $T_{1/2}$=1.63 ns 13 (1971FoZW), 1.75 ns *16* (1974Yo02). The adopted value is 1.91 ns 1. Others: 1955Be19, 1958Mc02.
268.75 *5*	3/2$^+$	15.4 ps *13*	B(E2)↑=0.083 *6* $T_{1/2}$: recoil-distance method (1979Bo10). Others: 13.7 ps *33* if B(E2)=0.083 *6*, I(γ+ce 269γ)=3.3% *3* and α(269γ)=0.15; 13.9 ps *35* (1986Ba19). Others: 1961Re02, 1969PrZV, 1970Sh12.
279.01 *5*	5/2$^+$&	18.6 ps *15*	B(E2)↑=0.314 *8* (1971Mc14) g=+0.296 *23* (1988St16,1988St09), +0.21 *2* (1986Ba19). $T_{1/2}$: recoil-distance method (1979Bo10). Others: 15.8 ps *30* if B(E2)=0.314, Iγ(279γ)-branching=98.5%, δ=−0.40; 20.4 ps *+37−26* (1988St16) Doppler-broadened line shape technique; 16.0 ps *28* (1986Ba19) Doppler-shift attenuation method. Other B(E2)′s: 1957El11, 1958Mc02, 1958Ma36, 1961Re02, 1970Sh12. Iγ(202γ)/Iγ(279γ)=0.0150 *12* (1971Mc14), 0.0142 (1970Sh12).
502.7 *3*	5/2$^+$&	1.77 ps *+19−12*	g=+1.2 *2* (1988St16,1988St09) $T_{1/2}$: other: <2.8 ps (recoil-distance method,1979Bo10). Branching: Iγ(426γ)/Iγ(503γ)=3/97 (1988St16).
547.5 *3*	7/2$^+$&	4.61 ps *+19−13*	g=+0.241 *21* (1988St16,1988St09) B(E2)=0.457 *12* (1971Fo12), 0.447 *22* (1971Mc14). $T_{1/2}$: others: 6.8 ps *5* (1979Bo10) recoil-distance method; 4.65 ps 28 if B(E2)=0.447 *22*, Iγ(547γ)-branching=94.4%; ≈5 ps (1974WaZA) Doppler-broadened lineshape; 4.57 ps *28* (1981Ve12) RDM; 4.6 ps *28* (1986Ba19) Doppler-shift attenuation method. Other B(E2)′s: 1957El11, 1961Co35, 1961Re02, 1970Sh12. Branching: Iγ(547γ):Iγ(279γ):Iγ(268.6γ)=100:0.7 *2*:5.2 *4* (1971Mc14), 100:–:7.3 (1970Sh12), 95:–:5 (1988St16).

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Coulomb excitation 1988St16,1981Ve12,1971Mc14 (continued)

^{197}Au Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
736.7 *3*	7/2+[&]	1.09 ps *+13−9*	g=+0.48 *14* (1988St16,1988St09) E(level): 960.3 keV (1971Mc14) if 457.7γ proceeds to 502.6 level.
855.4 *4*	9/2+[&]	2.67 ps *+25−15*	g=+0.34 *12* (1988St16,1988St09) $T_{1/2}$: others: 5.1 ps *22* (1979Bo10), 3.05 ps *35* (1981Ve12), recoil-distance method. Branching: Iγ(308γ)/Iγ(577γ)=14/86 (1988St16), 8/92 (1981Ve12).
888.05 *22*			Iγ(619γ)/Iγ(811γ)=0.27 *3* (1971Mc14).
935.72 *18*			Branching: Iγ(936γ):Iγ(667γ):Iγ(657γ)=100:100 *14*:49 *10* (1971Mc14).
1231.0 *8*	11/2+[&]	0.91 ps *1*	g=+0.37 *18* (1988St16) $T_{1/2}$: other: 1.18 ps *28* (1981Ve12). Branching: Iγ(376γ)/Iγ(683γ)=11/89 (1981Ve12).

[†] From Eγ's and scheme using least-squares fit to data.
[‡] From Adopted Levels, except as noted.
[#] From Doppler-broadened line shape technique (1988St16), except as noted.
[@] From Adopted Levels.
[&] From angular correlations of deexcitation rays (1988St16).

γ(^{197}Au)

γ(θ=0°,90°) spectra at Eα=14 MeV studied (1971Mc14).

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[&]	α[a]	Comments
77.35 *1*		77.350	1/2+	0.0	3/2+	M1+E2	−0.35 *1*	4.24 *7*	α(L)= 3.21 *6*; α(M)= 0.780 *14*; α(N+..)= 0.244 *5* Eγ (1963Ma08,1974HeYW), δ (1975Pr09) from (γ,γ) Mossbauer. 1974Ul01 studied α(exp) dependence on neutral vs +10 charge ^{197}Au.
191.5 *3*	18.0 *11*	268.75	3/2+	77.350	1/2+	M1+E2	0.14 *1*	1.173 *2*	α(K)= 0.9597 *22*; α(L)=0.16339 *7*; α(M)=0.03787 *3*; α(N+..)=0.01194 δ: from ce(L) ratios (1970Sh10) ^{197}Hg ε decay (64.1-h).
201.6 *3*	1.65 *10*	279.01	5/2+	77.350	1/2+	E2		0.369	α(K)= 0.1679; α(L)= 0.1506; α(M)= 0.0385; α(N+..)=0.01199 Mult.: from γ(θ) (1971Mc14).
268.5	5.2 *3*	547.5	7/2+	279.01	5/2+	M1+E2	+0.055 *10*	0.4654 *4*	α(K)= 0.3828 *4*; α(L)=0.06342; α(M)=0.01467; α(N+..)=0.00459 Eγ: from ΔE(levels) established by (268.5γ)(279γ)-coin (1971Mc14). Iγ: ΔJ=0 component subtracted from Iγ doublet.
268.75 *5*	1.12 *10*	268.75	3/2+	0.0	3/2+	E2(+M1)	>3.4	0.158 *12*	δ: from γ(θ) (1971Mc14). α(K)=0.0821, α(L)=0.0470, α(M)=0.01186,

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Coulomb excitation **1988St16,1981Ve12,1971Mc14 (continued)**

$\gamma(^{197}Au)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[&]	α[a]	Comments
									α(N+..)=0.00370,α=0.1446 if mult=E2. α(K)=0.1060, α(L)=0.0483, α(M)=0.01208, α(N+..)=0.00377, α=0.1702 if mult=E2(+M1), δ=3.4. E_γ: from ^{197}Hg ε decay (64.14 h). I_γ: calculated from Iγ-branching ratio via ^{197}Hg ε decay. δ: from L1+L2/L3=2.8 *3* (1970Sh10).
278.7	0.7 *2*	547.5	7/2$^+$	268.75	3/2$^+$	[E2]		0.1293	α(K)= 0.0750; α(L)= 0.0408; α(M)=0.01028; α(N+..)=0.00321 E_γ: from energy level difference. I(279γ)/I(268.6γ)=0.11 *3* (1971Mc14) (191γ)(279γ+269γ).
279.01 *5*	110 *5*	279.01	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.39 *2*	0.382 *4*	α(K)= 0.310 *4*; α(L)=0.05492 *20*; α(M)=0.01281 *4*; α(N+..)=0.00401 E_γ: from 1972Wi21 (^{197}Hg ε decay). δ: others: −0.41 *4* (1958Mc02), −0.33 *9* (1958Ma36), −0.40 *4* (1971Mc14).
308	14[#]	855.4	9/2$^+$	547.5	7/2$^+$	M1+E2	−0.30 *9*	0.302 *12*	α(K)= 0.247 *11*; α(L)= 0.0422 *8*; α(M)=0.00981 *16*; α(N+..)=0.00307 *5* E_γ: from level scheme (1988St16).
(376)		1231.0	11/2$^+$	855.4	9/2$^+$				E_γ: from level scheme (1981Ve12).
426	0.021 *2*	502.7	5/2$^+$	77.350	1/2$^+$				E_γ: from 1988St16. I_γ: from Iγ(426γ)/Iγ(503γ)=3/97 (1988St16) and Iγ(503γ)=0.69 *5*.
457.7 *3*		736.7	7/2$^+$	279.01	5/2$^+$	M1+E2	−0.26 *3*	0.1059 *12*	α(K)= 0.0871 *10*; α(L)=0.01445 *12*; α(M)=0.00334; α(N+..)=0.00105 E_γ: others: (n,n$'\gamma$) 457.7 *3* (1971Ba29), 457.9 *3* (1971Ne01). Placement based on (^{58}Ni,^{58}Ni$'\gamma$) (1988St16) and (d,d$'$), (n,n$'$), (n,n$'\gamma$) excitations.
502.6 *3*	0.69 *5*	502.7	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.24 *9*	0.084 *3*	α(K)= 0.0686 *23*; α(L)= 0.0113 *3*
547.5 *3*	100 *5*	547.5	7/2$^+$	0.0	3/2$^+$	E2		0.02102	α(K)=0.01561; α(L)=0.00407 Mult.: other $\gamma(\theta)$ measurements: 1981Ve12,1971Mc14, K/L=3.7 *4* (1961Re02).
576.5 *4*	86[#]	855.4	9/2$^+$	279.01	5/2$^+$	E2		0.01864	α(K)=0.01398; α(L)=0.00350 E_γ: from 1988St16 and 1981Ve12. Others: (n,n$'\gamma$) 1971Ba29, 577.1 *4* (1971Ne01). Placement from 1988St16 and 1981Ve12. Other: 1979Bo10 based on (d,d$'$), (n,n$'$), (n,n$'\gamma$) excited states. Mult.: other $\gamma(\theta)$ measurement: 1981Ve12.
619.4 *3*	0.14 *2*	888.05		268.75	3/2$^+$				

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Coulomb excitation 1988St16,1981Ve12,1971Mc14 (continued)

$\gamma(^{197}Au)$ (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	α a	Comments
656.8 *3*	0.13 *3*	935.72		279.01	$5/2^+$			
666.9 *3*	0.26 *3*	935.72		268.75	$3/2^+$			
683		1231.0	$11/2^+$	547.5	$7/2^+$	E2	0.01274	α(K)=0.00983; α(L)=0.00219 E_γ: from level scheme (1988St16,1981Ve12). Mult.: other $\gamma(\theta)$ measurement: 1981Ve12.
810.6 *3*	0.51 *4*	888.05		77.350	$1/2^+$			
935.7 *3*	0.26 *2*	935.72		0.0	$3/2^+$			

† $E\gamma$ measurements from 1971Mc14, except as noted.
‡ Relative photon intensity normalized to $I\gamma(547\gamma)=100$ at $E\alpha$=14 MeV (1971Mc14), except as noted.
# % relative photon intensity from ratio: $I\gamma(308\gamma)/I\gamma(577\gamma)=14/86$ (1988St16).
@ From $\gamma(\theta)$ of deexciting γ in coincidence with backscattered beam ions (1988St16), except as noted.
& From $\gamma(\theta)$ measurements (1988St16), except as noted.
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.

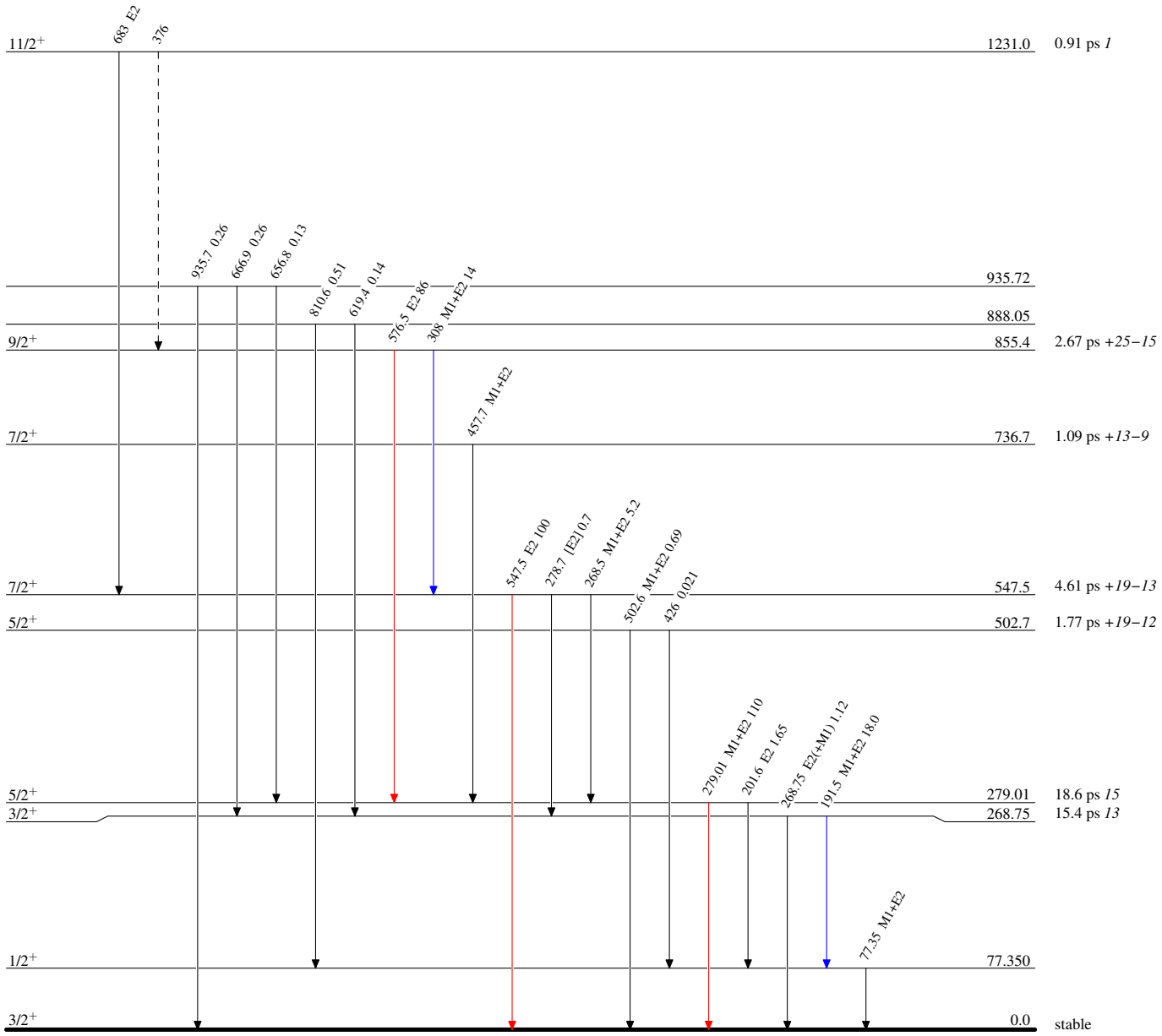
Coulomb excitation 1988St16,1981Ve12,1971Mc14

Level Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{197}_{79}Au_{118}$