Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

Q(β^-)=−3366.4 *15*; S(n)=10863.6 *5*; S(p)=6122.40 *6*; Q(α)=−5774.9 *4* 2021Wa16
S(2n)=19738.4 *10*, S(2p)=17259.6 *7* (2021Wa16).
Other measurement:
1995Dr05: ^{45}Sc(^{18}O,γ) E=54-149 MeV ^{18}O beams from the tandem-injected superconducting linac at the University of Washington Nuclear Physics Laboratory . Measured giant dipole resonance (GDR) energy spectra and angular distribution for decay of excited ^{63}Cu compound nucleus populated over a wide range of spin (J=0-47) and excitation energy (E=55-130 MeV) in the fusion of ^{18}O+^{45}Sc.

^{63}Cu Levels

Cross Reference (XREF) Flags

A	^{63}Ni β^- decay	K	^{62}Ni(p,p),(p,p′),(p,n):res	U	^{63}Cu(p,p′)
B	^{63}Zn $\varepsilon+\beta^+$ decay	L	^{62}Ni(d,n)	V	^{63}Cu(p,p′γ)
C	^{40}Ca(^{28}Si,5pγ)	M	^{62}Ni(^{3}He,d)	W	^{63}Cu(α,α′)
D	^{52}Cr(^{16}O,αpγ)	N	^{62}Ni(α,t)	X	^{64}Zn(d,^{3}Heγ)
E	^{52}Cr(^{18}O,AP2NG)	O	^{62}Ni(^{7}Li,^{6}He)	Y	^{64}Zn(pol d,^{3}He),(d,^{3}He)
F	^{60}Ni(α,p)	P	^{62}Ni(^{12}C,^{11}B)	Z	^{64}Zn(t,α)
G	^{60}Ni(α,pγ)	Q	^{62}Ni(^{16}O,^{15}N)	Others:	
H	^{60}Ni(^{19}F,^{16}O)	R	^{63}Cu(γ,γ′)	AA	^{65}Cu(p,t)
I	^{61}Ni(α,pnγ),^{62}Ni(α,p2nγ)	S	^{63}Cu(e,e′)	AB	Coulomb excitation
J	^{62}Ni(p,γ):E=res	T	^{63}Cu(n,n′γ)		

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
0.0	3/2−	stable	ABCDEFGHIJ LMNOPQR TUVWXYZ	XREF: Others: AA, AB μ=+2.2259 *4* (1978Lu08,2019StZV) Q=−0.210 *15* (1982Ef01,2021StZZ) Jπ: spin from optical spectroscopy (1976Fu06) and collinear laser spectroscopy (2010Vi07); π=− from L(t,α)=1 from 0^+. μ: from 2019StZV evaluation based on +2.221535 *3* measured by 1978Lu08 using Nuclear Magnetic Resonance method with ^{109}Ag as reference. Other: +2.2236 *4* (2010Vi07), using collinear and in-source laser spectroscopic technique. Q: from 2021StZZ compilation based on 0.210 *15* measured by 1982Ef01 using Muonic X-ray hyperfine structure. Other: −0.211 7 from 2010Vi07 using collinear laser spectroscopy. See also 2021StZZ compilation. δ<r^2>(^{65}Cu, ^{63}Cu)=−0.140 fm^2 *7* (stat) *20* (syst) (2020De21). δ<r^2>(^{65}Cu, ^{63}Cu)=−0.148 fm^2 *1* (stat) *17* (syst) (2016Bi08). Evaluated rms charge radius=3.8823 fs *15* (2013An02).
669.724 *6*	1/2−	0.200 ps *7*	B FGHIJ LMNOPQRSTUVWXYZ	XREF: Others: AA, AB B(E2)↑=0.0116 *6* Jπ: L(pol d,^{3}He)=1 from 0^+; L-1/2 from analyzing powers. $T_{1/2}$: weighted average of 0.215 ps *22* from (α,pγ) by DSAM, 0.196 ps *7* from (γ,γ′) by nuclear resonance fluorescence, and 0.22 ps *2* from Coulomb excitation by DSAM, 0.219 ps *48* from (d,^{3}Heγ) by DSAM.

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	T1/2#	XREF	Comments
				B(E2)↑: from Coulomb excitation. Other: 0.0098 *34* from (e,e′).
962.145 *8*	5/2−	0.59 ps *4*	BCDEFGHIJ MNOPQRSTUVWXYZ	XREF: Others: AA, AB B(E2)↑=0.0355 *17* Jπ: L(pol d,^{3}He)=3 from 0+; L-1/2 from analyzing powers. T1/2: weighted average of 0.57 ps *7* from (α,pγ) by DSAM, 1.9 ps *+6−3* from (α,pnγ) by DSAM, 0.57 ps *3* from (γ,γ′) by nuclear resonance fluorescence, 0.52 ps *+24−17* from (d,^{3}Heγ) by DSAM, and 0.61 ps *4* from Coulomb excitation by DSAM. Other: 0.54 ps *+7−6* from B(E2)↑=0.0355 *16*. B(E2)↑: from Coulomb excitation. Other: 0.0170 *25* from (e,e′), which gives a δ(962γ)=−0.33 *4* inconsistent with values from γ(θ) in (α,pγ) and Coulomb excitation.
1326.014 *12*	7/2−	0.59 ps *+6−5*	BCDEFGHIJ MNO RSTUVWXYZ	XREF: Others: AA, AB B(E2)↑=0.0445 *30* Jπ: L(pol d,^{3}He)=3 from 0+; L+1/2 from analyzing powers. T1/2: weighted average of 0.61 ps *6* from (α,pγ) by DSAM, 0.8 ps *+3−2* from (α,pnγ) by DSAM, 0.53 ps *+6−5* from (γ,γ′) by nuclear resonance, 0.51 ps *+14−10* from (p,p′γ) by DSAM, 0.81 ps *+20−18* from (d,^{3}Heγ) by DSAM, and 0.61 ps *6* from Coulomb excitation by DSAM. Other: 0.52 ps *4* from B(E2)↑=0.0445 *30* and adopted γ branching ratios. B(E2)↑: from Coulomb excitation. Other: 0.0073 *17* from (e,e′) is inconsistent with 0.039 *4* calculated from adopted T1/2.
1412.124 *13*	5/2−	1.48 ps *29*	B DEFG IJ LMNOPQR TUVWXYZ	XREF: Others: AA, AB B(E2)↑=0.013 *4* XREF: L(1390). Jπ: L(d,^{3}He)=L(t,α)=L(d,n)=L(^{3}He,d)=3 from 0+; 742.27γ E2 to 1/2−. T1/2: weighted average of 2.0 ps *3* from (α,pγ) by DSAM, 1.15 ps *+28−19* from measured width in (γ,γ′) , 1.7 ps *+59−11* from (d,^{3}Heγ) by DSAM. Other: 0.26 ps *+16−9* from B(E2)↑=0.013 *4* in Coulomb excitation and adopted γ branching ratios is discrepant.
1547.109 *11*	3/2−	115 fs *12*	B FG J MN R TUVWXYZ	XREF: Others: AA, AB Jπ: L(pol d,^{3}He)=L(t,α)=1 from 0+; 584.9γ D(+Q) to 5/2−. T1/2: weighted average of 122 fs *12* from (α,pγ) by DSAM, 114 fs *+16−13* from width in (γ,γ′), 97 fs *+22−18* in (p,p′γ) by DSAM, 300 fs *+550−130* in (d,^{3}Heγ) by DSAM. Other: 20 fs *+20−12* deduced from B(E2)↑=0.0096 *9* in Coulomb excitation and adopted γ branching ratios is in a disagreement.
1861.34 *5*	7/2−	0.64 ps *+14−9*	BCDEFG IJ R TUVWXYZ	XREF: Others: AA, AB B(E2)↑=0.0115 *15* XREF: W(1820?).

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				Jπ: L(pol d,^{3}He)=3 from 0^+; L+1/2 transfer from analyzing powers. $T_{1/2}$: weighted average of 1.14 ps *28* from (α,pγ), 1.4 ps *+14−10* from (α,pnγ), 0.65 ps *+16−11* from width in (γ,γ'), 0.53 ps *+14−9* from (p,p$'\gamma$), and 0.66 ps *+24−18* from (d,^{3}Heγ). Other: 0.24 ps *+4−3* from B(E2)↑=0.0115 *15* in Coulomb excitation and adopted γ-ray branching ratios is in a disagreement.
1952.03 *11*			D	
2012.274 *19*	$3/2^-$	33 fs *+7−5*	B FG J LMN qR TUVw Z	XREF: Others: AA, AB XREF: L(2020)q(2030)w(2030)Z(2019). Jπ: L(t,α)=1 from 0^+; 1048.8γ M1+E2 to $5/2^-$. $T_{1/2}$: weighted average of 35 fs *8* from (α,pγ) by DSAM, 32 fs *+7−5* from (p,p$'\gamma$) by DSAM, and 44 fs *+7−5* from width in (γ,γ').
2062.45 *8*	$(3/2)^-$	0.22 ps *8*	B FGH J MNO qR TUVw	XREF: Others: AA XREF: q(2030)w(2030). Jπ: L(^{3}He,d)=1 from 0^+; probable 342.5γ from $7/2^-$. But $(1/2)^-$ from (α,pγ). $T_{1/2}$: weighted average of 0.15 ps *7* from (α,pγ) and 0.30 ps *+10−5* from (p,p$'\gamma$), both by DSAM.
2081.32 *5*	$5/2^-$	123 fs *+26−20*	B FGH J R TUV	XREF: Others: AA Jπ: 534.0γ M1+E2 to $3/2^-$, 754.2γ D(+Q) to $7/2^-$. $T_{1/2}$: weighted average of 115 fs *+26−13* from (p,p$'\gamma$) by DSAM and 175 fs *+65−37* from width in (γ,γ') and adopted γ-ray branching ratios.
2092.48 *5*	$7/2^-$	0.22 ps *6*	BCDE GHIJ R TUV XYZ	XREF: Others: AA Jπ: (pol d,^{3}He)=3 from 0^+; L+1/2 transfer from analyzing powers. $T_{1/2}$: weighted average of 0.24 ps *8* from (α,pγ), 0.37 ps *+11−6* from (p,p$'\gamma$), and 0.165 ps *+52−45* from (d,^{3}Heγ). Other: 1.4 ps *+14−7* from (α,pnγ).
2207.84 *8*	$9/2^-$	0.31 ps *+10−5*	CDE GHI TUV Z	XREF: Others: AA Jπ: 1245.4γ E2, ΔJ=2 to $5/2^-$, 880.0γ M1+E2 to $7/2^-$. $T_{1/2}$: from DSAM in (p,p$'\gamma$).
2274.7 *4*	$(9/2^-)$		E	Jπ: 948.2 γ D+Q to $7/2^-$; 1880.1γ (Q) from $13/2^+$.
2336.48 *7*	$5/2^-$	0.35 ps *+12−7*	B fG J MNO R TuV XY	XREF: Others: AA XREF: f(2336)O(2350)u(2337)Y(2340)AA(2340) . E(level): from (n,n$'\gamma$). Other: 2336.55 *10* from (p,γ):E=res. Jπ: L(d,^{3}He)=L(^{3}He,d)=3 from 0^+; 2336.5γ D(+Q) to $3/2^-$. $T_{1/2}$: from DSAM in (p,p$'\gamma$). Other: 1.3 ps *+4−3* from width in (γ,γ').
2338 *10*	$3/2^+$,$5/2^+$		f S Z	XREF: f(2336)S(2300). Jπ: from L(t,α)=2 from 0^+. E3 excitation from $3/2^-$ indicates $9/2^+$ for a level at 2300 *100* in (e,e$'$).

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	T$_{1/2}$[#]	XREF	Comments
2404.77 *7*	7/2$^-$	0.125 ps *+37−21*	G J MN TUV XYZ	XREF: Others: AA E(level): from (n,n′γ). Other: 2404.7 *4* from (p,γ):E=res. Jπ: 2404.7γ E2 to 3/2$^-$; L(d,^{3}He,d)=L(d,^{3}He)=3 from 0$^+$. T$_{1/2}$: weighted average of 0.13 ps *+10−5* from (d,^{3}Heγ) and 0.125 ps *+37−21* from (p,p′γ), by DSAM.
2430.37 *7*			T	
2497.26 *2*	(3/2)	101 fs *+23−18*	B J R TUV X	Jπ: (3/2,5/2) from γ(θ) in (p,p′γ); 1827.7γ D(+Q) to 1/2$^-$. T$_{1/2}$: from DSAM in (p,p′γ). Other: 109 fs *+39−23* from width in (γ,γ′).
2503.50 *8*			Tu	XREF: u(2504). E(level): from (n,n′γ).
2505.08 *8*	9/2$^+$	1.5 ps *+3−2*	CDEFG IJ MNOPQ Tu WXYZ	XREF: Others: AA XREF: u(2504)aa(2510). Jπ: 9/2$^+$ from γ(θ) and γ(lin pol) in (α,pγ). T$_{1/2}$: from DSAM in (α,pnγ). Other: >67 fs from (d,^{3}Heγ).
2511.903 *18*	(3/2)$^+$	0.15 ps *+5−3*	B J R TUV X	XREF: Others: AA XREF: aa(2510). Jπ: L(p,p′)=3 from 3/2$^-$; 1840.0γ to 1/2$^-$; possible 1099.0γ to 5/2$^-$. T$_{1/2}$: from DSAM in (p,p′γ).
2535.83 *7*	5/2$^-$	0.33 ps *+18−8*	B J R TUV z	XREF: Others: AA XREF: z(2546)aa(2540). E(level): from ^{63}Zn ε+β$^+$ decay. Other: 2535.93 *8* from (p,γ):E=res. Jπ: allowed ε+β$^+$ decay from 3/2$^-$ parent; Mult=E2 for 443.07γ to 7/2$^-$ ruled out by RUL; T$_{1/2}$: from DSAM in (p,p′γ). Other: 0.109 ps *+39−23* from width in (γ,γ′).
2547.55 *8*	9/2$^-$		E I TU z	XREF: Others: AA XREF: z(2546)aa(2540). E(level): from (n,n′γ). Jπ: 9/2 from γ(θ) in (α,pnγ); L(p,t)=4 from 3/2$^-$ for a level at 2540 *10*.
2617.03 *10*			D	
2630.96 *10*	1/2$^-$,3/2$^-$		L T	E(level): from (n,n′γ). Jπ: L(d,n)=1 from 0$^+$.
2672.51 *13*	5/2$^-$,7/2$^-$	66 fs *+23−19*	h Tu Xyz	XREF: Others: AA XREF: h(2660)u(2673)y(2674)z(2673)aa(2680). E(level): from (n,n′γ). Jπ: L(d,^{3}He)=3 for a level 2674 *5* and L(t,α)=3 for a level at 2673 *10* most likely correspond to this level, even though they may be probably multiplets also including other components. T$_{1/2}$: from DSAM in (d,^{3}Heγ).
2677.17 *12*	11/2$^-$	0.61 ps *15*	DEFGhI STu	XREF: Others: AA XREF: h(2660)S(2730)u(2673)aa(2680). E(level): from (n,n′γ). Jπ: 1350.1γ E2, ΔJ=2 to 7/2$^-$, 469.0γ

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				M1(+E2) to 9/2$^-$. E4 excitation from 3/2$^-$ for a level at 2730 *50* in (e,e′) is consistent, which could indicate it is the same level here while there is no other level around with J^π consistent with L(e,e′)=4 from 3/2$^-$.
				$T_{1/2}$: weighted average of 0.58 ps *15* from (α,pγ) and 0.8 ps *+6−2* from (α,pnγ), by DSAM.
2678.07 *12*	(5/2$^-$,7/2$^-$)		J Tu yz	XREF: Others: AA XREF: u(2673)y(2674)z(2673)aa(2680). E(level): from (n,n′γ). Jπ: 1131.0γ to 3/2$^-$, 1716.8γ to 5/2$^-$; L(p,t)=4 from 3/2$^-$ for a level at 2680 *10*, which may be a multipet including this level.
2682.45 *9*	(1/2$^-$,3/2$^-$)		J m Tu	XREF: m(2686)u(2673). Jπ: L(^{3}He,d)=1 for a level at 2686 *20*, possibly a doublet including this 2682 level.
2696.69 *2*	1/2$^-$,3/2$^-$,5/2$^-$	0.18 ps *+10−5*	B J m R TUV	XREF: m(2686). Jπ: allowed $\varepsilon+\beta^+$ feeding from 3/2$^-$ parent. $T_{1/2}$: from DSAM in (p,p′γ).
2717.04 *8*	3/2$^-$,5/2$^-$	>0.2 ps	B J TUV	E(level): from (n,n′γ). Other: 2716.9 *4* from (n,γ):E=res. Jπ: allowed $\varepsilon+\beta^+$ feeding from 3/2$^-$ parent; 624.4γ to 7/2$^-$. $T_{1/2}$: from DSAM in (p,p′γ).
2764.56 *9*			f m TU Z	XREF: f(2773)m(2780)Z(2750). E(level): from (n,n′γ).
2775.84 *11*	(3/2$^-$)		f m Tu z	XREF: Others: AA XREF: f(2773)m(2780)u(2778)z(2775)aa(2790). E(level): from (n,n′γ). Jπ: from DWBA analysis of $\sigma(\theta)$ in (α,p) for a level at 2773.
2780.36 *7*	(3/2$^-$)	46 fs *+17−11*	B f J m R TuV z	XREF: Others: AA XREF: f(2773)m(2780)u(2778)z(2775)aa(2790). Jπ: L(^{3}He,d)=1 for a level at 2780; Mult=E2 for 244.3γ to 5/2$^-$ ruled out by RUL. $T_{1/2}$: from DSAM in (p,p′γ).
2808.14 *8*	3/2$^-$	>0.19 ps	B J L TUV Y	XREF: Others: AA XREF: Y(2798)aa(2820). E(level): from (n,n′γ). Other: 2806.6 *5* from (p,γ):E=res. Jπ: L(d,n)=1 from 0$^+$ for a level at 2810; 1481.0γ to 7/2$^-$. $T_{1/2}$: from DSAM in (p,p′γ).
2818.87 *20*			T	E(level): from (n,n′γ).
2832.95 *19*	(7/2$^-$)	200 fs *+68−56*	J S u Xyz	XREF: Others: AA XREF: S(2800)u(2831)y(2835)z(2836)aa(2820). E(level): from (d,^{3}Heγ). Other: 2831.3 from (p,γ):E=res. Jπ: L(d,^{3}He)=3 from 0$^+$ for a level at 2835 *5* and L(t,α)=3 for a level at 2836 *15*, which could be a doublet of 2833+2836. E2

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				excitation from 3/2⁻ in (e,e′) for a level at 2800 *100* very likely correspond to this level.
2835.83 *11*	(5/2⁻)		Tu yz	XREF: Others: AA XREF: u(2831)y(2835)z(2836)aa(2850). E(level): from (n,n′γ). Jπ: 976.0γ to 7/2⁻, 2166.0γ to 1/2⁻; L(d,^{3}He)=3 from 0⁺ for a level at 2835 *5* and L(t,α)=3 for a level at 2836 *15* level, both probably doublet of 2833+2835.
2847 *5*	1/2⁻,3/2⁻		Y	E(level): this level may be the same level as the 2858 level, but the evaluator lists it here as a separate level considering a large energy difference. Jπ: L(d,^{3}He)=1 from 0⁺.
2857.55 *7*	(1/2⁻,3/2⁻)	0.4 ps *+15−2*	B J M R TUV X z	XREF: M(2860)z(2864). E(level): from (n,n′γ). Other: 2857.27 *12* from (p,γ):E=res. Jπ: L(^{3}He,d)=1 for a level at 2860.
2869 *8*			m U z	XREF: Others: AA XREF: m(2860)z(2864)aa(2880).
2889.29 *4*	(1/2⁻,3/2,5/2⁻)		B J TUV	XREF: Others: AA XREF: aa(2880). Jπ: 2219.1γ to 1/2⁻, 1926.7γ to 5/2⁻.
2911.04 *12*			D	
2958.90 *11*			J TU	E(level): from (n,n′γ). Other: 2956.2 *8* from (p,γ):E=res.
2976.94 *6*	1/2⁻,3/2⁻,5/2⁻		J R TU	XREF: Others: AA XREF: AA(2990). Jπ: 2308.0γ to 1/2; L(p,t)=2 for a level at 2990 *20*.
3032.17 *9*	3/2⁻		M TU Y	XREF: Others: AA XREF: M(3040)Y(3037)AA(3040). E(level): from (n,n′γ). Jπ: L(d,^{3}He)=L(^{3}He,d)=1 from 0⁺; 1706.6γ to 7/2⁻ can′t be M3, since it would require an isomeric $T_{1/2}$>0.24 μs based on B(M3)(W.u.)=10 from RUL.
3044.52 *9*	(5/2)⁻		B J R TU Z	Jπ: L(t,α)=3 from 0⁺, L(p,t)=2 from 3/2⁻; 2372.6γ to 1/2⁻ favors 5/2⁻.
3095.21 *9*	(1/2,3/2,5/2⁻)		q Tu Z	XREF: Others: AA XREF: q(3100)u(3099)Z(3078)aa(3110). E(level): from (n,n′γ). Jπ: 2425.5γ to 1/2⁻.
3100.54 *4*	1/2⁻,3/2⁻		B J M R Tu Z	XREF: Others: AA XREF: M(3106)u(3099)Z(3117)aa(3110). Jπ: L(^{3}He,d)=1 from 0⁺.
3128.1 *11*	⁻		J q TU Z	XREF: Others: AA XREF: q(3100)Z(3143)AA(3140). Jπ: L(p,t)=2 from 3/2⁻ for a level at 3140 *20*;
3183 *8*	⁻		U	XREF: Others: AA XREF: AA(3190). Jπ: L(p,t)=4 for a level at 3190 *20*.
3208 *8*	3/2⁺,5/2⁺		U Z	Jπ: L(t,α)=2 from 0⁺ for a level at 3209 *15*.
3210 *20*	9/2⁻		F	XREF: Others: AA XREF: AA(3210).

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				Jπ: 9/2 from DWBA analysis of σ(θ) in (α,p) for a level at 3210; L(p,t)=4 from 3/2⁻ for a level at 3210 *20*.
3225.3 *6*	5/2⁻		J MN TU YZ	XREF: Others: AA XREF: M(3220)Z(3229)AA(3230). Jπ: L(³He,d)=3 from 0⁺; L(p,t)=4 from 3/2⁻ for a level at 3230 *20*; 2855.5γ to 1/2⁻.
3248 *3*	(5/2)		F TU	XREF: F(3254). E(level): from (n,n′γ). Jπ: from DWBA analysis of σ(θ) in (α,p).
3263.7 *5*	(5/2⁻)		J	XREF: Others: AA XREF: AA(3260). Jπ: L(p,t)=4 from 3/2⁻ for a level at 3260 *20*; 2593.8γ to 1/2⁻.
3280	5/2⁻,7/2⁻		PQ	Jπ: from L(^{16}O,^{15}N)=L(^{12}C,^{11}B)=3.
3292.4 *6*	(3/2⁺,5/2⁺)		J M Tu	XREF: M(3295)T(3090.8?)u(3294). Jπ: L(³He,d)=2 from 0⁺ for a level at 3295, which could be a doublet of 3292+3298.
3295.00 *9*	(11/2⁺)		D	Jπ: proposed in (^{16}O,αpγ) based on γ-decay pattern and theoretical prediction.
3297.62 *10*	3/2⁻	16 fs *+16−9*	J u XY	XREF: u(3294). Jπ: L(pol d,³He)=1 from 0⁺ for a level at 3296 *5*, with L+1/2 transfer from analyzing powers (1991Se09).
3307.03 *7*	(3/2⁺)		f J sTu w z	XREF: Others: AA XREF: f(3308)s(3300)T(3313.2)u(3311)w(3320)z(3303)aa(3310). Jπ: L(t,α)=3 from 0⁺ and L(p,p′)=L(α,α′)=L(p,t)=3 from 3/2⁻ give 3/2⁺,5/2⁺, which is likely for a doublet of 3307+3310; 2627.25γ to 1/2⁻ level. Other: E3 excitation from 3/2⁻ in (e,e′) gives 9/2⁺ for a level at 3300 *100*.
3309.6 *5*	(3/2⁺,5/2⁺)		f J s u w z	XREF: Others: AA XREF: f(3308)s(3300)u(3311)w(3320)z(3303)aa(3310). Jπ: see Jπ comments for 3307 level.
3370 *8*			U	XREF: Others: AA XREF: aa(3380).
3389 *15*			Z	XREF: Others: AA XREF: aa(3380).
3404.41 *9*	(1/2 to 7/2)[@]		J R U	
3418.16 *4*	(1/2 to 7/2)[@]		J TU	
3426.0 *21*	1/2⁻,3/2⁻		M Tu	XREF: u(3431). Jπ: L(³He,d)=1 from 0⁺ for a level at 3424.
3429.80 *8*	(3/2)⁻		F J R Tu Y	XREF: Others: AA XREF: F(3434)u(3431)Y(3434)AA(3440). Jπ: L(d,³He)=1 from 0⁺ for a level at 3434 *5*; (3/2) from DWBA analysis of σ(θ) for a level at 3434 in (α,p).
3461.17 *18*	11/2⁺	0.2 ps *+4−1*	CDE G I	Jπ: from γ(θ) and γ(lin pol) in (α,pγ). $T_{1/2}$: from DSAM in (α,pnγ). Other: ≤0.42 ps from DSAM in (α,pγ).
3461.3 *8*	5/2⁺		J R TU W Z	XREF: U(3458)W(3430)Z(3460). Jπ: L(t,α)=L(³He,d)=2 from 0⁺; 956γ to to 9/2⁺.

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
3465.00 *11*	1/2⁻,3/2⁻	0.07 ps *+15–4*	J L XY	XREF: L(3470). Jπ: L(d,n)=L(d,^{3}He)=1 from 0⁺.
3474.59 *12*	5/2⁺		F J M TU Z	XREF: Others: AA XREF: AA(3470). Jπ: L(^{3}He,d)=2 from 0⁺; 5/2 from DWBA analysis of σ(θ) in (α,p).
3500	3/2⁺,5/2⁺		PQ W	XREF: W(3510). Jπ: from L(^{16}O,^{15}N)=L(^{12}C,^{11}B)=2.
3541.3 *2*	(1/2⁻ to 7/2)[@]		J	Jπ: and 2579.1γ to 5/2⁻.
3556.8 *5*	(11/2⁻)		E	Jπ: 1008.9γ to 9/2⁻; 11/2⁻ proposed in (^{18}O,αp2nγ) based on γ decay pattern, but now experimental evidence is available.
3565.6 *15*			T	
3569.47 *10*			J	
3580.71 *12*	1/2⁻,3/2⁻	5 fs *+8–4*	J M XY	XREF: Others: AA XREF: M(3576). Jπ: L(^{3}He,d)=L(d,^{3}He)=1 from 0⁺.
3583.3 *6*	(5/2⁻,7/2⁻)	0.10 ps *+13–5*	XYZ	Jπ: L(d,^{3}He)=(3) from 0⁺. But L(t,α)=2 from 0⁺ for a level at 3583 *15* is in disagreement.
3607 *3*	5/2⁻,7/2⁻		ST YZ	XREF: S(3600)Y(3600)Z(3617). Jπ: from L(d,^{3}He)=3 from 0⁺ for a level at 3600 *20*. E2 excitation from 3/2⁻ in (e,e′) for a level at 3600 *100* is consistent, which could be the same level here.
3647.51 *7*	(1/2,3/2,5/2⁻)		J	Jπ: 2977.7γ to 1/2⁻.
3656.8 *8*	(1/2,3/2,5/2⁻)		J T	Jπ: strong primary 4908γ from 1/2⁻ resonance in (p,γ):E=res.
3681.0 *7*	5/2⁻,7/2⁻	63 fs *+29–23*	XY	XREF: Others: AA XREF: Y(3678). Jπ: L(d,^{3}He)=3 from 0⁺.
3683 *15*	3/2⁺,5/2⁺		Z	Jπ: L(t,α)=2 from 0⁺.
3708	1/2⁻,3/2⁻		M	Jπ: L(^{3}He,d)=1 from 0⁺.
3719.04 *8*	(1/2,3/2)⁺		f J U	XREF: Others: AA XREF: f(3713)AA(3720). Jπ: from L(p,p′)=L(p,t)=3 from 3/2⁻; 3049.24γ to 1/2⁻. But (5/2) from analysis of σ(θ) in (α,p) for a level at 3712 is in a disagreement, which may indicate a different level in (α,p).
3730 *20*	5/2⁻,7/2⁻		f Y	XREF: f(3713). Jπ: L(d,^{3}He)=3 from 0⁺.
3737.3 *5*	(13/2⁻)		E	Jπ: 1529.7γ Q, ΔJ=2 to 9/2⁻.
3740.19 *13*	(3/2,5/2)⁺		J W	XREF: W(3740). Jπ: from L(α,α′)=3 from 3/2⁻; 2193.04γ to 3/2⁻.
3774.43 *9*	(1/2,3/2,5/2⁻)		J	This level from (p,γ):E=res is considered by the evaluator as a different level from 3775.2 *4* in (d,^{3}Heγ) because they have no overlapping de-exciting γ transitions. Jπ: 1712.22γ to (1/2)⁻.
3775.2 *4*	5/2⁻,7/2⁻	116 fs *+44–33*	XY	See comments for 3774.43 level. Jπ: L(d,^{3}He)=3 from 0⁺.

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
3779 *15*	3/2+,5/2+		Z	XREF: Others: AA XREF: aa(3790). Jπ: L(t,α)=2 from 0+.
3785.53 *4*	1/2−,3/2−		J M	Jπ: L(^{3}He,d)=1 from 0+.
3810 *20*	+		U Z	XREF: Z(3818). E(level): from (p,p′). Other: 3818 *15* from (t,α). Jπ: from L(p,p′)=3 from 3/2−.
3840 *20*	(9/2+)		F S U W	XREF: Others: AA XREF: F(3839)S(3800)W(3830). E(level): from (p,p′) and (p,t). Jπ: from L(p,p′)=L(p,t)=3 from 3/2−; (9/2+) from analysis of σ(θ) in (α,p); E3 excitation from 3/2− in (e,e′) gives 9/2+ for a level at 3800 *100*, which could indicate it is the same level here.
3866.55 *10*	(1/2− to 7/2)[@]		J s	XREF: s(3860). Jπ: and 2904.33γ to 5/2−.
3885.68 *11*	(5/2+)		F J M u	XREF: F(3888)M(3881)u(3890). Jπ: L(^{3}He,d)=(2) from 0+; (5/2+) from analysis of σ(θ) in (α,p).
3888.8 *6*	5/2−,7/2−	119 fs *+79−48*	sT XY	XREF: s(3860). E(level): from (d,^{3}Heγ). Other: 3889.7 *21* from (n,n′γ). Jπ: L(d,^{3}He)=3 from 0+.
3895.1 *9*	5/2−,7/2−	28 fs *+11−8*	sT XY	XREF: s(3860)Y(3890). E(level): from (d,^{3}Heγ). Other: 3892 *3* from (n,n′γ). Jπ: L(d,^{3}He)=3 from 0+.
3897.45 *8*	(3/2+,5/2+)[@]		J u z	XREF: Others: AA XREF: u(3890)z(3895)aa(3900). Jπ: L(p,p′)=3 from 3/2− for a level at 3890 *20*; L(p,t)=3 from 3/2− for a level at 3900 *20*; L(t,α)=2 from 0+ for a level at 3895 *15*.
3902.1 *10*	(3/2+,5/2+)		J u z	XREF: Others: AA XREF: u(3890)z(3895)aa(3900). Jπ: L(p,p′)=3 from 3/2− for a level at 3890 *20*; L(p,t)=3 from 3/2− for a level at 3900 *20*; L(t,α)=2 from 0+ for a level at 3895 *15*.
3920 *15*			Z	
3932.3 *6*	(13/2−)		E	Jπ: 1255.4γ to 11/2−; 13/2− proposed in (^{18}O,αp2nγ) based on γ decay pattern, but no experimental evidence is available.
3947			M	
3960.1 *10*			J	
3970	7/2+,9/2+		F M PQ	XREF: F(3964)M(3980)P(3970)Q(3960). Jπ: L(^{3}He,d)=L(^{12}C,^{11}B)=L(^{16}O,^{15}N)=4 from 0+.
3978.47 *11*	(1/2,3/2,5/2−)		J	Jπ: 1916.25γ to (1/2)−.
4017.08 *11*	1/2−,3/2−		J lM Y	XREF: l(4030)M(4008)Y(4023). Jπ: L(d,^{3}He)=1 from 0+.
4039.1 *17*	(3/2−)		lM R T z	XREF: l(4030)z(4043).

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				E(level): from (n,n′γ). Jπ: L(d,n)=1 from 0+ for a level at 4030; probable γ to 7/2−.
4054.84 *11*	1/2−,3/2−		F J M z	XREF: M(4060)z(4043). Jπ: L(^{3}He,d)=1 from 0+ for a level at 4060.
4110.5 *7*	1/2+	16 fs *+5−4*	T XY	XREF: Y(4111). E(level): from (d,^{3}Heγ). Jπ: L(d,^{3}He)=0 from 0+.
4113.20 *16*	(1/2+)		J t z	XREF: t(4117)z(4117). Jπ: L(t,α)=0 for a level at 4117 *15*.
4119.1 *10*	(1/2+)		J R t z	XREF: t(4117)z(4117). Jπ: L(t,α)=0 for a level at 4117 *15*.
4124.61 *14*	(1/2 to 7/2−)[@]		J T	Jπ: and 2113.3γ to 3/2−.
4129.10 *13*	13/2+	2.3 ps *+14−7*	DE I	E(level): from (^{16}O,αpγ). Jπ: 1623.9γ E2, ΔJ=2 to 9/2+; 668.1γ D, ΔJ=1 to 11/2+. $T_{1/2}$: from DSAM in (α,pnγ).
4132.78 *14*	(1/2− to 7/2−)[@]		F J Y	XREF: F(4135)Y(4133). Jπ: γs to 3/2− and 5/2− disfavor 7/2+ and 1/2+, respectively. Other: (9/2) from (α,p) for a level at 4135 is in disagreement, which might indicate a different level.
4145.1 *7*	(1/2− to 7/2−)[@]		f J T	XREF: f(4135). Jπ: γs to 3/2− and 5/2− disfavor 7/2+ and 1/2+, respectively.
4148.18 *14*	(1/2,3/2,5/2−)		J	Jπ: 3478.35γ to 1/2−.
4155.56 *12*	13/2+	3.5 ps *14*	CDE G I	Jπ: 1649.8γ E2, ΔJ=2 to 9/2+;694.1γ M1+E2 to 11/2+ (α,pnγ). $T_{1/2}$: from DSAM in (α,pnγ). Other: <0.56 from (α,pγ).
4183.5 *24*			sT	XREF: s(4200).
4189 *4*			sT	XREF: s(4200).
4225.59 *14*	5/2−,7/2−	20 fs *+9−7*	J s XYZ	XREF: s(4200)Y(4222)Z(4230). Jπ: L(d,^{3}He)=L(t,α)=3 from 0+.
4285.03 *10*	5/2−,7/2−	31 fs *+8−6*	J T XY	XREF: Y(4286). Jπ: L(d,^{3}He)=3 from 0+.
4289.49 *10*	1/2−,3/2−		J R Z	XREF: R(4294)Z(4292). Jπ: L(t,α)=1 from 0+ for a level at 4292 *15*.
4354.75 *15*	(1/2−,3/2−)		J y	XREF: y(4356). Jπ: L(d,^{3}He)=1 from 0+ for a level at 4356 *5*.
4358.43 *14*	(1/2−,3/2−)		J R y	XREF: y(4356). Jπ: L(d,^{3}He)=1 from 0+ for a level at 4356 *5*.
4362.0 *24*	(1/2,3/2,5/2−)		T	Jπ: 3692γ to 1/2−.
4375 *5*	5/2−,7/2−		YZ	XREF: Z(4371). Jπ: L(d,^{3}He)=L(t,α)=3 from 0+.
4382.11 *14*	(1/2 to 7/2)[@]		J T	E(level): from (p,γ) E=res.
4403.97 *10*	(1/2−,3/2,5/2−)		J	Jπ: 3733.13γ to 1/2−, 3440.72γ to 5/2−.
4413.8 *14*			T	
4419.70 *10*	(1/2 to 7/2−)[@]		J	Jπ: and 2408.38γ to 3/2−.
4432.85 *28*	1/2+	16 fs *+9−6*	T XYZ	XREF: Y(4436)Z(4440). E(level): from (d,^{3}Heγ).

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				Jπ: L(d,^{3}He)=L(t,α)=0 from 0$^+$.
4457.02 *9*	(1/2,3/2,5/2$^-$)		J	Jπ: 3787.17γ to 1/2$^-$.
4470.78 *9*	(1/2 to 7/2)@		J W	XREF: W(4470).
4497.65 *16*	17/2$^+$	4.1 ns *1*	CDE G I	μ=+1.56 *10* (1983Ka24,2020StZV) μ: from 1983Ka24 using IPAD. See also 2020StZV evaluation. Jπ: spin=17/2,13/2 from γ(θ) in (α,pγ); 342γ E2, ΔJ=2 to 13/2$^+$. $T_{1/2}$: from 342γ(t) in (α,pnγ).
4498.45 *12*	5/2$^-$	8 fs *2*	J T XYz	XREF: Y(4503)z(4510). Jπ: L(d,^{3}He)=3 from 0$^+$; 3838.6γ to 1/2$^-$ cannot be M3 based on RUL.
4501.43 *10*	(1/2 to 7/2)@		J z	XREF: z(4510).
4505.52 *9*	(1/2 to 7/2)@		J z	XREF: z(4510).
4511.6 *24*	(5/2$^-$,7/2$^-$)		R T z	XREF: R(4513)z(4510). Jπ: L(t,α)=3 from 0$^+$ for a level at 4510 *15*.
4517.15 *13*	(1/2,3/2,5/2$^-$)		J	Jπ: 3847.3γ to 1/2$^-$.
4531.39 *9*	(1/2 to 7/2)@		J	
4533 *4*			T	
4576.70 *17*	15/2$^+$	2.4 ps *+14−10*	DE I	Jπ: 447.1γ M1+E2 to 13/2$^+$; spin from γ(θ) in (α,pnγ) and excitation function. $T_{1/2}$: from DSAM in (α,pnγ).
4581 *15*	(5/2$^-$,7/2$^-$)		YZ	XREF: Y(4580)Z(4581). Jπ: L(d,^{3}He)=3 from 0$^+$ for a level at 4580 *40*.
4592.89 *13*	(1/2 to 7/2)@		J m	XREF: m(4594).
4598 *4*			m T	XREF: m(4594).
4613.4 *5*	(15/2$^-$)		E	Jπ: 1936.6γ (Q), ΔJ=(2) to 11/2$^-$.
4640.0 *5*	(1/2 to 7/2)@		J m T	XREF: m(4635).
4643.75 *12*	(1/2 to 7/2)@		J z	XREF: z(4650).
4646.70 *14*	(1/2 to 7/2)@		f J m z	XREF: f(4666)m(4635)z(4650).
4666			F	
4678			M	
4691.80 *12*	(1/2 to 7/2)@		J m	XREF: m(4678).
4735 *5*	1/2$^+$		M Y	XREF: M(4734). Jπ: L(d,^{3}He)=0 from 0$^+$.
4752.66 *12*			J	
4782			M	
4789.14 *10*	(1/2 to 7/2)@		J	
4795.77 *10*	(1/2$^+$)		J y	XREF: y(4799). Jπ: from L(d,^{3}He)=0 for a level at 4799 *5*.
4806.23 *10*	(1/2$^+$)	7 fs *5*	J T Xy	XREF: y(4799). Jπ: from L(d,^{3}He)=0 for a level at 4799 *5*.
4810.20 *16*	(1/2 to 7/2)@		J	
4838.50 *15*			J M	XREF: M(4844).
4869.85 *14*	(1/2 to 7/2)@		J m T	XREF: m(4871).
4876.65 *25*	(1/2 to 7/2)@		J m	XREF: m(4871).
4890	7/2$^+$,9/2$^+$		Q	Jπ: L(^{16}O,^{15}N)=4 from 0$^+$.
4904			M	
4919.0 *6*	(13/2$^+$ to 19/2$^+$)		C G M	XREF: M(4904). Jπ: 13/2,15/2$^+$,19/2$^+$ proposed in (α,pγ)

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				based on γ(θ) and γ(lin pol) while no evidence is available; 421.4γ to 17/2+.
4955.40 *10*	5/2−,7/2−		J Y	Jπ: L(d,3He)=3 from 0+.
5007.11 *16*	(19/2+)		D	Jπ: 510.0γ to 17/2+; (19/2+) proposed in (16O,αpγ).
5016.45 *11*	(1/2 to 7/2)@		J	
5053.0 *2*	(1/2 to 7/2)@		J	
5073.47 *9*	(1/2 to 7/2)@		J	
5101.18 *10*	(1/2 to 7/2)@		J	
5139.6 *2*	(1/2 to 7/2)@		J M T	
5161.19 *13*	(1/2 to 7/2)−		J Y	Jπ: L(d,3He)=3,1 from 0+.
5191 *5*			m Y	XREF: m(5216).
5225.5 *3*	(1/2 to 7/2)@		J m	XREF: m(5216).
5253 *4*			T	
5273.75 *11*	(1/2 to 7/2)@		J	
5292 *4*			m T	XREF: m(5302).
5304.3 *24*	(3/2−,5/2,7/2−)		m T	XREF: m(5302). Jπ: 3977γ to 7/2−, 5304γ to 3/2−.
5311.95 *13*	(1/2 to 7/2)@		J	
5318.12 *16*			CD	E(level): from (16O,αpγ).
5335.3 *3*	(1/2+)		J M Y	XREF: M(5330). Jπ: from L(d,3He)=(0) from 0+.
5358.6 *4*	(19/2)+	0.8 ps *+3−1*	E I	Jπ: 860.6γ M1+E2, ΔJ=1 to 17/2+. T1/2: from DSAM in (α,pnγ).
5366.07 *14*	(1/2 to 7/2)@		J M T	XREF: M(5358)T(5362).
5401.8 *21*			M T	XREF: M(5397).
5413.1 *2*	(17/2+)	>2 ps	E I	E(level): from (α,pnγ). Jπ: 836.1γ (M1+E2) to 15/2+. T1/2: from DSAM in (α,pnγ).
5420 *5*			Y	
5446			M	
5489			M	
5533			M	
5542.7 *2*			J s	XREF: s(5500).
5566 *4*			M sT	XREF: M(5568)s(5500). E(level): from (n,n′γ).
5571.36 *10*	(1/2 to 7/2)@		J	
5579.30 *13*	(1/2 to 7/2)@		J	
5591.62 *11*	(1/2 to 7/2)@		J M	XREF: M(5595).
5602.0 *3*	(1/2 to 7/2)@		J	
5635			M	
5646 *5*	(5/2−,7/2−)		Y	Jπ: L(d,3He)=(3) from 0+.
5713 *5*			Y	
5723			M	
5734.8 *3*	(1/2 to 7/2)@		J	
5756			M	
5768.13 *16*	(21/2+)		DE	E(level): from (16O,αpγ). Jπ: 1271.0γ Q, ΔJ=2 to 17/2+.
5797.32 *10*			J M	XREF: M(5795).
5803.87 *10*	(1/2 to 7/2)@		J	
5828.33 *14*	(1/2 to 7/2)@		J	

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
5835 *3*	(5/2⁻,7/2⁻)		M T Y	XREF: Y(5831). E(level): from (n,n′γ). Jπ: L(d,^{3}He)=(3) from 0⁺.
5859			M	
5867.63 *15*	(1/2 to 7/2)[@]		J	
5994			M	
6032			M	
6070			M	
6092.78 *11*			J	
6104			M	
6166			M	
6283.14 *14*	(19/2⁺)		CDE I	E(level): from (^{16}O,αpγ). Jπ: 1786.6γ D, ΔJ=1 to 17/2⁺, assuming spin increases as level energy.
6374.86 *10*			J	
6495.5 *11*	(23/2)⁺		E I	Jπ: 1136.5γ (19/2)⁺, 726.4γ to (21/2⁺).
6749.4 *6*			E	
7073.71 *20*	(23/2⁺)		CDE	Jπ: 789.7γ E2, ΔJ=2 to (19/2⁺), assuming spin increases as level energy.
7282.7 *9*	(1/2 to 7/2)		J	Jπ: weak 1947.4γ to (1/2⁺).
7363.94 *9*	(1/2 to 7/2)		J	Jπ: weak 2557.6γ to (1/2⁺).
7400.3 *5*	1/2[&]		J	
7475.27 *9*	1/2[&]		J	
7479.2 *6*			E	
7513.2 *4*	(3/2)[&]		J S	XREF: S(7500).
7532.20 *22*	1/2[&]		J	
7607.80 *10*	(1/2)[&]		J s	
7712.2 *2*	(1/2 to 7/2)		J	Jπ: weak 2905.9γ to (1/2⁺).
7732.60 *11*	(1/2)[&]		J	
7745.37 *13*	(1/2 to 7/2)		J	Jπ: weak 2410γ to (1/2⁺).
7772.7 *5*	(1/2 to 7/2)		J	Jπ: weak 2966.5γ to (1/2⁺).
8364.7 *5*	(25/2⁺)		E	Jπ: 1291.8γ D, ΔJ=1 to (23/2⁺).
8389 *2*	1/2⁺	15 eV	K	
8400 *2*	1/2⁺	10 eV	K	
8467 *2*	1/2⁺	15 eV	K	
8500 *2*	1/2⁺	15 eV	K	
8523 *2*	1/2⁺	125 eV	K	
8526 *2*	1/2⁺	30 eV	K	
8538 *2*	(1/2⁺)	15 eV	K	
8551 *2*	1/2⁺	35 eV	K	
8556 *2*	1/2⁻	30 eV	K	
8558 *2*	1/2⁺	30 eV	K	
8562 *2*	1/2⁺	135 eV	K	
8564.66 *24*	1/2⁻[&]	180 eV	JK	XREF: K(8563). E(level),Jπ: IAS(^{63}Ni g.s.).
8574 *2*	1/2⁺	90 eV	K	
8594			K	
8612 *2*	1/2⁺	30 eV	K	
8618 *2*	1/2⁺	10 eV	K	
8628.8 *4*	(5/2⁻)		JK	E(level): IAS(^{63}Ni 87 level).
8632 *2*	1/2⁺	65 eV	K	
8639.32 *23*	(5/2⁻)		JK	
8657.7	5/2⁻		K	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
8661 *2*	1/2$^+$	25 eV	K	
8686 *2*	1/2$^+$	50 eV	K	
8693.7 *6*	(3/2$^-$)	20 eV	JK m	XREF: m(8660). J$^{\pi}$: L(^{3}He,d)=1 from 0$^+$ for a level at 8660 *40*; (3/2$^-$) from analysis of (p,γ):res data.
8700.9 *6*	(3/2$^-$)		JK m	XREF: m(8660). J$^{\pi}$: L(^{3}He,d)=1 from 0$^+$ for a level at 8660 *40*; (3/2$^-$) from analysis of (p,γ):res data.
8706 *2*	1/2$^+$	55 eV	K	
8713 *2*	1/2$^+$	60 eV	K	
8716.7	3/2$^-$	5 eV	K	
8718.6 *8*	(3/2$^-$)	10 eV	JK	
8719.1 *8*	(3/2$^-$)		Jk	
8719.2 *5*	(3/2$^-$)		Jk	
8727.5 *5*	(3/2$^-$)	15 eV	JK	
8731 *2*	1/2$^+$	15 eV	K	
8731.7 *6*	(3/2$^-$)	10 eV	JK	
8734.6 *6*	(3/2$^-$)	5 eV	JK	
8738.6 *5*	(3/2$^-$)	10 eV	JK	
8740 *2*	1/2$^+$	40 eV	K	
8741.5	3/2$^-$	40 eV	K	
8742 *2*	3/2$^-$	20 eV	K	
8743.2 *6*	(3/2$^-$)	125 eV	JK	
8743.7 *5*	(3/2$^-$)		J	
8746.6 *6*	(3/2$^-$)	5 eV	JK	
8747.6 *6*	(3/2$^-$)	20 eV	JK	
8750.5 *5*	(3/2$^-$)	5 eV	JK	
8750 *2*	1/2$^+$	10 eV	K	
8760 *2*	1/2$^+$	50 eV	K	
8765 *2*	(3/2$^-$)	10 eV	K m	XREF: m(8790).
8794 *2*	1/2$^+$	15 eV	K	
8798 *2*	1/2$^+$	15 eV	K	
8799 *2*	(3/2$^-$,1/2$^-$)	10 eV	K m	XREF: m(8790).
8800 *2*	(3/2$^-$,1/2$^-$)	10 eV	K m	XREF: m(8790).
8801 *2*	1/2$^+$	10 eV	K	
8806 *2*	(5/2$^+$,3/2$^+$)	5 eV	K	
8812 *2*	1/2$^+$	40 eV	K	
8820 *2*	1/2$^+$	55 eV	K	
8829 *2*	1/2$^+$	10 eV	K	
8836 *2*	1/2$^+$	45 eV	K	
8837 *2*	1/2$^+$	10 eV	K	
8876 *2*	1/2$^+$	145 eV	K	
8884 *2*	1/2$^+$	60 eV	K	
8898 *2*	1/2$^+$	25 eV	K	
8905 *2*	(1/2$^+$)	5 eV	K	
8919 *2*	1/2$^+$	10 eV	K	
8922 *2*	1/2$^-$	20 eV	K	
8924 *2*	1/2$^+$	10 eV	K	
8931 *2*	1/2$^+$	20 eV	K	
8937 *2*	1/2$^+$	90 eV	K	
8943 *2*	1/2$^+$	115 eV	K	
8975 *2*	1/2$^+$	20 eV	K	
8992 *2*	1/2$^+$	35 eV	K	
9000 *2*	1/2$^+$	35 eV	K	
9001 *2*	1/2$^+$	10 eV	K	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF
9002 *2*	(5/2$^+$,3/2$^+$)	5 eV	K
9014 *2*	1/2$^+$	100 eV	K
9020 *2*	(1/2$^-$)	15 eV	K
9021 *2*	1/2$^+$	40 eV	K
9029 *2*	1/2$^+$	20 eV	K
9033 *2*	1/2$^+$	30 eV	K
9038 *2*	1/2$^+$	40 eV	K
9043 *2*	1/2$^+$	90 eV	K
9048 *2*	1/2$^+$	30 eV	K
9050 *2*	1/2$^+$	70 eV	K
9057 *2*	1/2$^+$	75 eV	K
9058 *2*	(5/2$^+$,3/2$^+$)	10 eV	K
9064 *2*	1/2$^+$	15 eV	K
9068.0	1/2$^-$,3/2$^-$	20.0 eV *6*	K
9068 *2*	(5/2$^+$,3/2$^+$)	5 eV	K
9090 *2*	1/2$^+$	40 eV	K
9092 *2*	1/2$^+$	50 eV	K
9094 *2*	1/2$^+$	95 eV	K
9097 *2*	1/2$^+$	40 eV	K
9103 *2*	1/2$^+$	35 eV	K
9109.9	1/2$^-$,3/2$^-$	24.9 eV *38*	K
9110 *2*	1/2$^-$	10 eV	K
9111.9	3/2$^-$	5.1 eV *3*	K
9112 *2*	1/2$^+$	25 eV	K
9116 *2*	1/2$^-$	20 eV	K
9118.4	3/2$^-$	16.8 eV *39*	K
9120.1	3/2$^-$	73.4 eV *48*	K
9123.6	3/2$^-$	15.1 eV *40*	K
9124 *2*	1/2$^-$	30 eV	K
9126.0	3/2$^-$	21.1 eV *36*	K
9128 *2*	(5/2$^+$)	15 eV	K
9133.6	3/2$^-$	70.9 eV *43*	K
9135.6	3/2$^-$	19.2 eV *34*	K
9138 *2*	1/2$^+$	60 eV	K
9147 *2*	1/2$^+$	20 eV	K
9152 *2*	(3/2$^-$,1/2$^-$)	10 eV	K
9153 *2*	(3/2$^-$,1/2$^-$)	10 eV	K
9154 *2*	1/2$^+$	20 eV	K
9161 *2*	(1/2$^-$,3/2$^-$)	5 eV	K
9166 *2*	1/2$^+$	60 eV	K
9170 *2*	1/2$^+$	35 eV	K
9171 *2*	(1/2$^-$,3/2$^-$)	5 eV	K
9175 *2*	(3/2$^-$,1/2$^-$)	5 eV	K
9205.5	1/2$^-$	30 eV	K
9273.6	1/2$^-$	30 eV	K
9278.7	1/2$^-$	30 eV	K
9363.3	3/2$^-$	10 eV	K
9364.3	3/2$^-$	12 eV	K
9365.1	1/2$^-$	63 eV	K
9389.9	1/2$^-$	16 eV	K
9421.8	1/2$^-$	40 eV	K
9489.5 *6*			E
9508.5	1/2$^-$	66 eV	K
9538.3	1/2$^-$	69 eV *7*	K
9549.5	1/2$^-$	82 eV *12*	K

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
9566.8	1/2−	170 eV *15*	K	
9567.6	1/2−	66 eV *14*	K	
9571.6	1/2−	86 eV *11*	K	
9575.5	1/2−	104 eV *10*	K	
9576.4	1/2−	191 eV *13*	K	
9584	1/2−	207 eV *13*	K	
9586.1	1/2−	125 eV *11*	K	
9595.7	1/2−	160 eV *13*	K	
9596.6	1/2−	512 eV *19*	K	
9598.9	1/2−	51 eV *8*	K	
9608.4	3/2−	41 eV *5*	K	
9615.7	1/2−	31 eV *7*	K	
9619.2	1/2−	50 eV *8*	K	
9631.8	1/2−	25 eV	K	
9682.8	1/2−	35 eV	K	
9808.3	9/2+		K	
9811.1	1/2−	40 eV	K	
9811.2 *15*	9/2+		JK	XREF: K(9812.2).
9822.2	1/2−	32 eV *7*	K	
9823.5	3/2−	13 eV *5*	K	
9830.2	1/2−	46 eV *6*	K	
9834.2 *15*			J	
9836.7	9/2+		K	
9846.2 *15*	9/2+		JK	XREF: K(9848).
9850.3	9/2+		JK	E(level): from (p,γ):E=res. Other: 9852.5 from (p,p):res.
9854.4	9/2+		K	
9855.5	9/2+		JK	
9856.6	9/2+		K	
9857.6	9/2+		K	
9858.9	9/2+		K	
9859.7	3/2−	26.5 eV *32*	K	
9863.5	9/2+		K	
9865			J	Jπ: 9/2+ IAS assigned in 1972Sz01; but not 9/2+ IAS in 1979Vo01,1976Ar01 in (p,γ):E=res.
9866.8	3/2−	22 eV *4*	K	
9868.8	9/2+		K	
9888.5	3/2−	23.4 eV *4*	K	
9915.2	1/2−	72 eV *7*	K	
9922.0	1/2−	81.7 eV *7*	K	
9970 *40*	7/2+,9/2+		M	Jπ: L(^{3}He,d)=4 from 0+.
≈10860	5/2+		K	
10960 *40*			K M	XREF: K(10950).
11145			K	
11230 *40*	9/2+		M	Jπ: L(He,d)=4 from 0+; IAS of 2514, 9/2+ level in ^{63}Ni.
11243			K	
11383			K	
11553			K	
11633			K	
11725			K	
11858			K	
11961			K	
12099			K	

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Adopted Levels, Gammas (continued)

^{63}Cu Levels (continued)

E(level)[†]	XREF
14.9×10^3	S
17.2×10^3	S
32.0×10^3	S

[†] From a least-squares fit to γ-ray energies with uncertainties for levels connected with those γ rays; where precise E(level) values are given but without precise γ-ray energies, E(level) values are from (p,γ):E=res, deduced by 1986De14 based on their measured Eγ data which however are not explicitly listed in 1986De14; where there are no γ data, E(level) values are from transfer reactions, unless otherwise noted.

[‡] For yrast levels in (HI,xnγ) datasets, it is assumed spin ascends as excitation energy increases; assignments for levels in (p,p),(p,p′),(p,n):res are from R-matrix analysis of resonance data.

[#] Halflife from DSAM in (d,^{3}Heγ) and width from R-matrix analysis of measured $\sigma(E_p)$ in (p,p),(p,p′),(p,n):res, unless otherwise noted.

[@] (1/2:7/2) based on weak primary γ from 1/2 or (1/2) resonance in (p,γ):E=res. Additional arguments are given under comments if available.

[&] From analysis of resonance data in (p,γ):E=res.

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$

Additional information 1.

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
669.724	1/2$^-$	669.35 *22*	100	0.0	3/2$^-$	M1+E2	0.106 *5*	0.000520 *7*	B(M1)(W.u.)=0.363 *13*; B(E2)(W.u.)=15.7 *16* α(K)=0.000467 *7*; α(L)=4.62×10^{-5} *6*; α(M)=6.50×10^{-6} *9* α(N)=1.990×10^{-7} *28* E_γ: unweighted average of 669.64 *5* from ^{63}Zn ε+β^+ decay, 669.4 *3* from (α,pγ), 668.5 *2* from (α,pnγ), 669.6 *1* from (n,n′γ), and 669.6 *1* from (d,^{3}Heγ). Mult.: M1 from ce data in ^{63}Zn ε decay; E2 component from Coulomb excitation. δ: deduced from adopted B(E2)↑=0.0116 *6* and $T_{1/2}$=0.200 ps *7*.
962.145	5/2$^-$	962.04 *4*	100	0.0	3/2$^-$	M1+E2	−0.479 *21*	0.000251 *4*	B(M1)(W.u.)=0.0341 *+26−22*; B(E2)(W.u.)=14.6 *+16−14* α(K)=0.0002257 *32*; α(L)=2.229×10^{-5} *32*; α(M)=3.13×10^{-6} *4* α(N)=9.60×10^{-8} *14* E_γ: weighted average of 962.07 *4* from ^{63}Zn ε+β^+ decay, 962.0 *1* from (^{16}O,αpγ), 961.8 *1* from (^{18}O,α2pnγ), 961.8 *3* from (α,pγ), 962.1 *2* from (α,pnγ), 962.1 *1* from (n,n′γ), and 962.0 *2* from (d,^{3}Heγ). Mult.: D+Q from $\gamma(\theta)$; E1+M2 ruled out by RUL. δ: from $\gamma(\theta)$ in Coulomb excitation. Others: −0.47 *+4−9* from (α,pγ), −0.3 *3* from (α,pnγ); 0.51 *4* from adopted B(E2)↑=0.0355 *17* and adopted $T_{1/2}$=0.59 ps *4*.
1326.014	7/2$^-$	364.9 *1*	19.4 *4*	962.145	5/2$^-$	M1+E2	−0.060 *5*	2.04×10^{-3} *3*	α(K)=0.001833 *26*; α(L)=0.0001836 *26*; α(M)=2.58×10^{-5} *4* α(N)=7.84×10^{-7} *11* B(M1)(W.u.)=0.124 *12*; B(E2)(W.u.)=5.8 *+12−11* E_γ: weighted average of 365.0 *1* from (^{16}O,αpγ), 364.9 *1* from (^{18}O,αp2nγ), 364.9 *2* from (α,pnγ), 364.9 *1* from (n,n′γ), and 364.7 *2* from (d,^{3}Heγ). Other: 365.2 *4* from ^{63}Zn ε+β^+ decay. I_γ: weighted average of 20.8 *13* from (α,pγ), 19.3 *4* from (p,γ):E=res, 18.8 *5* from (p,p′γ), and 20.2 *6* from Coulomb excitation. Others: 18 *4* from ^{63}Zn ε+β^+ decay, 22.2 *33* from (n,n′γ), and 23.5 *25* from (d,^{3}Heγ). Mult.,δ: D+Q and δ from $\gamma(\theta)$; E1+M2 ruled out by RUL. Other δ values: −0.10 *+3−5* in (p,p′γ), −0.18 *+8−10* in (α,pγ), −0.25 *30* in (α,pnγ).
		1326.90 *10*	100.0 *4*	0.0	3/2$^-$	E2		0.0001757 *25*	B(E2)(W.u.)=13.1 *12* α(K)=0.0001268 *18*; α(L)=1.251×10^{-5} *18*; α(M)=1.758×10^{-6} *25* α(N)=5.37×10^{-8} *8*; α(IPF)=3.47×10^{-5} *5*

From ENSDF

$^{63}_{29}Cu_{34}$-18

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
1412.124	5/2$^-$	449.5 *4*	30.4 *4*	962.145	5/2$^-$	M1+E2	+0.115 *10*	1.27×10^{-3} *2*	E_γ: weighted average of 1326.99 *11* from ^{63}Zn ε+β$^+$ decay, 1327.0 *1* from (^{16}O,αpγ), 1326.7 *1* from (^{18}O,αp2nγ), 1326.6 *3* from (α,pγ), 1327.0 *2* from (α,pnγ), and 1327.0 *2* from (n,n′γ). Other: 1327.0 *4* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Others: 100 *6* from ^{63}Zn ε+β$^+$ decay, 100.0 *13* from (α,pγ), 100.0 *33* from (n,n′γ), 100.0 *5* from (p,p′γ), 100.0 *25* from (d,^{3}Heγ), and 100.0 *10* from Coulomb excitation. Mult.: Q from γγ(DCO) in (^{16}O,αpγ) and (^{18}O,αp2nγ); M2 ruled out by RUL. Other: Q(+M3) with δ=−0.017 *52* from γ(θ) in (p,p′γ). α(K)=0.001140 *16*; α(L)=0.0001137 *16*; α(M)=1.600×10^{-5} *23* α(N)=4.87×10^{-7} *7* B(M1)(W.u.)=0.035 *+9−6*; B(E2)(W.u.)=4.0 *+13−9*
		742.27 *10*	8.4 *5*	669.724	1/2$^-$	E2		0.000571 *8*	E_γ: unweighted average of 449.93 *5* from ^{63}Zn ε+β$^+$ decay, 448.0 *1* from (^{16}O,αpγ), 449.7 *5* from (^{18}O,α2pnγ), 450.0 *1* from (n,n′γ), and 449.7 *2* from (d,^{3}Heγ). I_γ: weighted average of 31.1 *22* from ^{63}Zn ε+β$^+$ decay, 28.8 *17* from (α,pγ), 30.4 *4* from (p,γ):E=res, 30.8 *9* from (n,n′γ), 30.5 *14* from (p,p′γ). Others: 56 *6* from (d,^{3}Heγ), and 24.4 *11* from Coulomb excitation are discrepant. Mult.,δ: D+Q and δ from Coulomb excitation; E1+M2 ruled out by RUL. Other δ values: +0.09 *+49−23* in (p,p′γ), +0.11 *+25−18* in (α,pγ). B(E2)(W.u.)=6.9 *+17−12* α(K)=0.000512 *7*; α(L)=5.11×10^{-5} *7*; α(M)=7.18×10^{-6} *10* α(N)=2.161×10^{-7} *30* E_γ: from ^{63}Zn ε+β$^+$ decay. Other: 742.0 *15* from (n,n′γ). I_γ: weighted average of 9.1 *11* from ^{63}Zn ε+β$^+$ decay, 9.1 *4* from (p,γ):E=res, 8.0 *4* from (p,p′γ), and 5.9 *11* from Coulomb excitation. Other: 13.7 *14* from (α,pγ) and 17 *6* from (n,n′γ) seem discrepant. Unweighted average of all is 10.5 *17*. Mult.: Q from γ(θ) in (α,pγ) and (p,p′γ); M2 ruled out by RUL.

From ENSDF

$^{63}_{29}Cu_{34}$-19

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
1412.124	5/2−	1411.7 *4*	100.00 *13*	0.0	3/2−	M1+E2	+0.66 *+5−7*	0.0001641 *25*	B(M1)(W.u.)=0.0027 *+7−4*; B(E2)(W.u.)=1.00 *+26−22* α(K)=0.0001050 *15*; α(L)=1.033×10^{-5} *15*; α(M)=1.453×10^{-6} *21* α(N)=4.46×10^{-8} *6*; α(IPF)=4.72×10^{-5} *9* E_γ: unweighted average of 1412.07 *5* from ^{63}Zn ε+β$^+$ decay, 1410.0 *1* from (^{16}O,αpγ), 1412.3 *3* from (^{18}O,αp2nγ), 1411.8 *3* from (α,pγ), 1412.1 *1* from (n,n′γ), and 1412.2 *2* from (d,^{3}Heγ). I_γ: from Coulomb excitation. Others: 100 *4* from ^{63}Zn ε+β$^+$ decay, 100 *6* from (^{18}O,αp2nγ), 100.0 *24* from (α,pγ), 100.0 *4* from (p,γ):E=res, 100 *4* from (n,n′γ), 100.0 *17* from (p,p′γ), and 100 *6* from (d,^{3}Heγ). Mult.: D+Q from γ(θ); E1+M2 ruled out by RUL. δ: weighted average of +0.76 *7* from Coulomb excitation, +0.61 *+9−8* from (α,pγ), +0.62 *+5−7* from (p,p′γ).
1547.109	3/2−	584.90 *15*	24.4 *11*	962.145	5/2−	(M1(+E2))	+0.10 *+14−15*	0.000698 *22*	α(K)=0.000627 *19*; α(L)=6.22×10^{-5} *20*; α(M)=8.75×10^{-6} *27* α(N)=2.67×10^{-7} *8* B(M1)(W.u.)=0.182 *32*; B(E2)(W.u.)<59 E_γ: weighted average of 584.85 *15* from ^{63}Zn ε+β$^+$ decay and 585.0 *2* from (n,n′γ). I_γ: unweighted average of 24 *5* from ^{63}Zn ε+β$^+$ decay, 24.5 *21* from (α,pγ), 28.2 *5* from (p,γ):E=res, 21.1 *9* from (n,n′γ), 22.1 *5* from (p,p′γ), and 26.3 *13* from Coulomb excitation. Mult.: D(+Q) from γ(θ); Δπ=no from level scheme. δ: weighted average of +0.05 *+14−15* from (α,pγ) and +0.17 *+16−17* from (p,p′γ).
		877.0 *2*	2.62 *25*	669.724	1/2−	(M1(+E2))	−0.6 *+7−16*	0.00031 *4*	α(K)=0.00028 *4*; α(L)=2.8×10^{-5} *4*; α(M)=3.9×10^{-6} *6* α(N)=1.19×10^{-7} *16* B(M1)(W.u.)=0.0043 *+30−35*; B(E2)(W.u.)<14 E_γ: from (n,n′γ). Other: 877.2 *8* from ^{63}Zn ε+β$^+$ decay. I_γ: weighted average of 2.62 *25* from (p,p′γ), 2.7 *13* from ^{63}Zn ε+β$^+$ decay, 2.9 *4* from (p,γ):E=res, 2.1 *7* from (n,n′γ), and 1.9 *10* from Coulomb excitation. Mult.: D(+Q) from γ(θ); Δπ=no from level scheme.
		1547.05 *6*	100.0 *5*	0.0	3/2−	M1+E2	+0.20 *7*	0.0001783 *27*	B(M1)(W.u.)=0.0391 *+45−40*; B(E2)(W.u.)=1.1 *+9−7* α(K)=8.64×10^{-5} *12*; α(L)=8.48×10^{-6} *12*;

From ENSDF

$^{63}_{29}Cu_{34}$-20

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									α(M)=1.193×10^{-6} *17* α(N)=3.67×10^{-8} *5*; α(IPF)=8.22×10^{-5} *13* E_γ: weighted average of 1547.03 *6* from ^{63}Zn ε+β$^+$ decay, 1546.6 *4* from (α,pγ), 1547.1 *1* from (n,n′γ), and 1547.3 *3* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Others: 100 *4* from ^{63}Zn ε+β$^+$ decay, 100.0 *21* from (α,pγ), 100.0 *32* from (n,n′γ), 100.0 *6* from (p,p′γ), and 100.0 *16* from Coulomb excitation. Mult.: D+Q from γ(θ); E1+M2 ruled out by RUL. δ: unweighted average of +0.13 *+5−4* in (α,pγ) and +0.27 *5* in (γ,γ′). Other: +0.05 *+6−8* in (p,p′γ).
1861.34	7/2$^-$	448.4[@b] *5*		1412.124	5/2$^-$				E_γ: seen only in (^{18}O,αp2nγ); contaminated by other γ with similar energy.
		534.0[@] *3*	5.12 *26*	1326.014	7/2$^-$	[M1,E2]		0.00116 *32*	α(K)=0.00104 *28*; α(L)=1.05×10^{-4} *29*; α(M)=1.5×10^{-5} *4* α(N)=4.4×10^{-7} *12* I_γ: weighted average of 5.09 *26* from (^{18}O,αp2nγ) and 6.3 *18* from Coulomb excitation. B(M1)(W.u.)=0.0063 *+11−12* if M1, B(E2)(W.u.)=38 *7* if E2.
		898.9 *1*	77.3 *18*	962.145	5/2$^-$	M1+E2	+0.040 *7*	0.000278 *4*	α(K)=0.0002495 *35*; α(L)=2.463×10^{-5} *34*; α(M)=3.46×10^{-6} *5* α(N)=1.063×10^{-7} *15* B(M1)(W.u.)=0.0200 *+33−37*; B(E2)(W.u.)=0.069 *+28−25* E_γ: weighted average of 899.1 *4* from ^{63}Zn ε+β$^+$ decay, 899.0 *1* from (^{16}O,αpγ), 898.8 *1* from (^{18}O,αp2nγ), 898.7 *3* from (α,pγ), 899.1 *2* from (α,pnγ), 899.2 *4* from (n,n′γ), and 899.1 *2* from (d,^{3}Heγ). I_γ: unweighted average of 82 *17* from ^{63}Zn ε+β$^+$ decay, 76.7 *32* from (α,pγ), 81.8 *18* from (p,γ):E=res, 81.8 *23* from (n,n′γ), 75 *4* from (p,p′γ), 69.5 *17* from (d,^{3}Heγ), and 74.5 *18* from Coulomb excitation. Mult.: D+Q from γ(θ); E1+M2 ruled out by RUL. δ: from γ(θ) in Coulomb excitation. Others: +0.05 *+3−2* or −5.1 *+9−16* in (p,p′γ), +0.05 *5* in (α,pγ), +0.05 *+10−20* in (α,pnγ).
		1861.1 *1*	100.0 *17*	0.0	3/2$^-$	E2		0.000317 *4*	B(E2)(W.u.)=1.46 *+24−27* α(K)=6.46×10^{-5} *9*; α(L)=6.34×10^{-6} *9*; α(M)=8.92×10^{-7} *12* α(N)=2.74×10^{-8} *4*; α(IPF)=0.0002448 *34* E_γ: weighted average of 1861.2 *3* from ^{63}Zn ε+β$^+$ decay, 1861.0 *1* from (^{16}O,αpγ), 1860.9 *1* from (^{18}O,αp2nγ), 1861.2 *2* from (α,pnγ), 1861.2 *3* from (n,n′γ), and 1861.3 *1* from (d,^{3}Heγ). Other: 1861.0 *4* from (α,pγ).

From ENSDF

$^{63}_{29}Cu_{34}$-21

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									I_γ: from (d,^{3}Heγ). Others: 100 *15* from ^{63}Zn $\varepsilon+\beta^+$ decay, 100.0 *32* from (α,pγ), 100.0 *18* from (p,γ):E=res, 100.0 *29* from (n,n′γ), 100 *4* from (p,p′γ), and 100.0 *22* from Coulomb excitation. Mult.: Q from $\gamma(\theta)$ in (α,pγ), $\gamma\gamma$(DCO) in (^{16}O,αpγ) and (^{18}O,αp2nγ); M2 ruled out by RUL. Other: E2(+M3) with δ=−0.1 *1* from (α,pnγ), +0.07 *+7−5* from (p,p′γ).
1952.03		990.0 *1*	100	962.145	5/2$^-$				E_γ: from (^{16}O,αpγ).
2012.274	3/2$^-$	464.0 *14*	4.6 *8*	1547.109	3/2$^-$	[M1]		1.17×10^{-3} *2*	α(K)=0.001046 *16*; α(L)=0.0001043 *16*; α(M)=1.467×10^{-5} *23* α(N)=4.47×10^{-7} *7* B(M1)(W.u.)=0.159 *+41−39*
		599.147	4.0 *11*	1412.124	5/2$^-$	[M1]		0.000658 *9*	I_γ: from (p,γ):E=res. Other: 14 *6* for a possible doublet in (n,n′γ). α(K)=0.000591 *8*; α(L)=5.86×10^{-5} *8*; α(M)=8.25×10^{-6} *12* α(N)=2.522×10^{-7} *35* B(M1)(W.u.)=0.064 *21*
		1048.8 *5*	52.7 *11*	962.145	5/2$^-$	M1+E2	+0.23 *+15−9*	0.000205 *4*	E_γ,I_γ: from (p,γ):E=res. α(K)=0.0001840 *35*; α(L)=1.814×10^{-5} *35*; α(M)=2.55×10^{-6} *5* α(N)=7.83×10^{-8} *15* B(M1)(W.u.)=0.150 *+26−32*; B(E2)(W.u.)=12 *+19−8* E_γ: from ^{63}Zn $\varepsilon+\beta^+$ decay. Others: 1048.7 *8* from (α,pγ) and 1049.0 *17* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 42 *11* from ^{63}Zn $\varepsilon+\beta^+$ decay, 48 *6* from (α,pγ), 53.0 *28* from (n,n′γ), and 55.0 *32* from (p,p′γ). Mult.,δ: D+Q and δ from $\gamma(\theta)$ in (α,pγ); E1+M2 ruled out by RUL. Other: ≤+0.36 in (p,p′γ); >7 also from (α,pγ) is ruled out by RUL.
		1341.7 *6*	32 *6*	669.724	1/2$^-$	(M1(+E2))	−0.6 *+7−16*	0.000160 *13*	α(K)=0.000116 *6*; α(L)=1.14×10^{-5} *7*; α(M)=1.60×10^{-6} *9* α(N)=4.91×10^{-8} *27*; α(IPF)=3.1×10^{-5} *6* B(M1)(W.u.)=0.034 *+30−29*; B(E2)(W.u.)<51 E_γ: from ^{63}Zn $\varepsilon+\beta^+$ decay. Other: 1342.0 *18* from (n,n′γ). I_γ: unweighted average of 23 *8* from ^{63}Zn $\varepsilon+\beta^+$ decay, 46.3 *11* from (p,γ):E=res, 33 *12* from

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$^{63}_{29}Cu_{34}$-22

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									(n,n′γ), and 24.2 *32* from (p,p′γ). Other: 74 *7* from (α,pγ) is largely discrepant with others.
2012.274	$3/2^-$	2011.4 *3*	100.0 *21*	0.0	$3/2^-$	(M1(+E2))		0.000350 *29*	Mult.: D(+Q) from $\gamma(\theta)$ in (p,p′γ); $\Delta\pi$=no from level scheme. α(K)=5.48×10^{-5} *14*; α(L)=5.37×10^{-6} *14*; α(M)=7.55×10^{-7} *20* α(N)=2.32×10^{-8} *6*; α(IPF)=0.000289 *28* E_γ: weighted average of 2011.8 *5* from ^{63}Zn ε+β^+ decay, 2011.4 *7* from (α,pγ), and 2011.2 *3* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 100 *16* from ^{63}Zn ε+β^+ decay, 100 *7* from (α,pγ), 100 *4* from (n,n′γ), and 100 *4* from (p,p′γ). Mult.: D(+Q) from $\gamma(\theta)$; $\Delta\pi$=no from level scheme. δ: 0.0 *3* or >1.4 in (p,p′γ), +0.41 *14* or +1.4 *3* in (γ,γ'), +0.06 *+9−8* or +3.1 *+13−8* in (α,pγ). B(M1)(W.u.)=0.042 *8* if M1, B(E2)(W.u.)=18.1 *+34−32* if E2.
2062.45	$(3/2)^-$	515.0 *10*	75.9 *19*	1547.109	$3/2^-$	(M1+E2)		0.0013 *4*	α(K)=0.00116 *33*; α(L)=1.16×10^{-4} *34*; α(M)=1.6×10^{-5} *5* α(N)=4.9×10^{-7} *13* E_γ: from ^{63}Zn ε+β^+ decay. Other: 515.0 *14* from (n,n′γ). I_γ: weighted average of 76.1 *13* from (p,γ):E=res and 61 *10* from (p,p′γ). Others: 170 *85* from (n,n′γ), 19 *7* from ^{63}Zn ε+β^+ decay, 147 *10* from (α,pγ) are discrepant. Mult.: D+Q from $\gamma(\theta)$ in (α,pγ), if J=3/2; $\Delta\pi$=no from level scheme. δ: −0.10 *+8−10* from (α,pγ) if J(2062)=3/2. Other: −3.2 *+10−18* for J=3/2 also from (α,pγ) ruled out by RUL. B(M1)(W.u.)=0.27 *+15−7* if M1. B(E2)(W.u.)=1.7×10^3 *+10−5* exceeds RUL=300 if E2.
		1392.37 *10*	100.0 *11*	669.724	$1/2^-$	(M1+E2)		0.000167 *12*	α(K)=0.000110 *5*; α(L)=1.08×10^{-5} *5*; α(M)=1.52×10^{-6} *7* α(N)=4.66×10^{-8} *21*; α(IPF)=4.5×10^{-5} *6* E_γ: weighted average of 1392.51 *14* from ^{63}Zn ε+β^+ decay and 1392.3 *1* from (n,n′γ). Other: 1392.3 *12* from (α,pγ). I_γ: from (p,γ):E=res. Others: 100 *13* from ^{63}Zn ε+β^+ decay, 1 *9* from (α,pγ), 100.0 *11* from (p,γ):E=res, 100 *14* from (n,n′γ), and 100 *7* from (p,p′γ). Mult.: D+Q from $\gamma(\theta)$ in (α,pγ), if J=3/2; $\Delta\pi$=no from level scheme. δ: +0.27 *+16−15* or −3.7 *+12−25* in (α,pγ) and +0.49 *+∞−19* in (p,p′γ), if J=3/2. B(M1)(W.u.)=0.018 *+10−5* if M1, B(E2)(W.u.)=16 *+9−5* if E2.
		2062.1 *2*	33.3 *17*	0.0	$3/2^-$	(M1+E2)	−0.26 *+16−18*	0.000345 *8*	α(K)=5.14×10^{-5} *8*; α(L)=5.04×10^{-6} *7*; α(M)=7.09×10^{-7} *10* α(N)=2.185×10^{-8} *32*; α(IPF)=0.000287 *7* B(M1)(W.u.)=0.0017 *+9−5*; B(E2)(W.u.)=0.05 *+9−4* E_γ: from (n,n′γ). Other: 2062.1 *3* from ^{63}Zn ε+β^+ decay.

From ENSDF

$^{63}_{29}Cu_{34}$-23

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
2081.32	5/2$^-$	534.0 *6*	23.4 *23*	1547.109	3/2$^-$	M1+E2	+0.23 *+13−11*	0.00088 *4*	I_γ: weighted average of 29.5 *29* from ^{63}Zn ε+β$^+$ decay, 33.3 *11* from (p,γ):E=res, and 41 *4* from (p,p′γ). Others: 31 *5* from (α,pγ), 75 *27* from (n,n′γ), and 41 *4* from (p,p′γ). Mult.: D+Q from γ(θ) in (α,pγ), if J=3/2; Δπ=no from level scheme. δ: −0.26 *+16−18* from (α,pγ) if J=3/2. Other: <−7 or >7 also from (α,pγ) for J=3/2 ruled out by RUL. α(K)=0.00079 *4*; α(L)=7.9×10^{-5} *4*; α(M)=1.11×10^{-5} *5* α(N)=3.37×10^{-7} *16* B(M1)(W.u.)=0.104 *23*; B(E2)(W.u.)=34 *+43−25*
		754.2 *1*	70 *7*	1326.014	7/2$^-$	(M1(+E2))	0.4 *+5−4*	0.00042 *5*	E_γ: weighted average of 533.8 *6* from ^{63}Zn ε+β$^+$ decay and 535.0 *14* from (n,n′γ). I_γ: weighted average of 33 *11* from ^{63}Zn ε+β$^+$ decay, 25.6 *26* from (p,γ):E=res, and 21.3 *23* from (p,p′γ). Other: 79 *29* from (n,n′γ) is discrepant. α(K)=0.00038 *4*; α(L)=3.7×10^{-5} *4*; α(M)=5.3×10^{-6} *6* α(N)=1.61×10^{-7} *17* B(M1)(W.u.)=0.10 *6*; B(E2)(W.u.)<213 E_γ: other: 754.6 *7* from ^{63}Zn ε+β$^+$ decay. I_γ: weighted average of 50 *28* from ^{63}Zn ε+β$^+$ decay, 69 *5* from (p,γ):E=res, 54 *8* from (n,n′γ), and 86 *7* from (p,p′γ). Mult.: D(+Q) from (p,p′γ); Δπ=no from level scheme. δ: from (p,p′γ). Others: +0.28 *8* or +6 *+6−3* in (α,pγ).
		1119.0 *18*	55 *6*	962.145	5/2$^-$	M1+E2	−0.41 *+31−46*		B(M1)(W.u.)=0.024 *+6−10*; B(E2)(W.u.)=6 *+11−5* I_γ: unweighted average of 61.5 *26* from (p,γ):E=res, and 49 *4* from (p,p′γ). Other: 167 *30* from (n,n′γ) for a doublet. Mult.: D+Q from γ(θ) in (p,p′γ); E1+M2 ruled out by RUL. δ: from (p,p′γ). Other: >2.2 also from (p,p′γ) ruled out by RUL.
		2081.5 *3*	100.0 *26*	0.0	3/2$^-$	(M1(+E2))		0.000379 *31*	α(K)=5.15×10^{-5} *13*; α(L)=5.05×10^{-6} *13*; α(M)=7.10×10^{-7} *18* α(N)=2.19×10^{-8} *5*; α(IPF)=0.000322 *30*

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$^{63}_{29}Cu_{34}$-24

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									E_γ: from ^{63}Zn $\varepsilon+\beta^+$ decay. Other: 2081.4 *3* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 100 *11* from ^{63}Zn $\varepsilon+\beta^+$ decay, 100 *5* from (n,n′γ), and 100 *6* from (p,p′γ). Mult.: D(+Q) from (p,p′γ); $\Delta\pi$=no from level scheme. δ: +0.03 *+11−10* or −3.7 *+10−34* from (p,p′γ). B(M1)(W.u.)=0.0080 *+16−14* if M1, B(E2)(W.u.)=3.2 *6* if E2.
2092.48	7/2$^-$	231.1[@] *5*	1.5[@] *6*	1861.34	7/2$^-$	[M1]		0.00613 *9*	α(K)=0.00549 *8*; α(L)=0.000555 *8*; α(M)=7.81×10^{-5} *12* α(N)=2.356×10^{-6} *35* B(M1)(W.u.)=0.060 *+35−26* E_γ,I_γ: other: 231.0 *12* with Iγ=12 *7* from (n,n′γ).
		680.2[@] *5*	6.4[@] *8*	1412.124	5/2$^-$	[M1,E2]		0.00061 *11*	α(K)=0.00055 *10*; α(L)=5.5×10^{-5} *10*; α(M)=7.7×10^{-6} *15* α(N)=2.3×10^{-7} *4* B(M1)(W.u.)=0.0100 *+41−24* if M1, B(E2)(W.u.)=37 *+15−9* if E2.
		765.2 *1*	76 *8*	1326.014	7/2$^-$	(M1(+E2))	−0.2 *5*	0.00039 *4*	α(K)=0.00035 *4*; α(L)=3.5×10^{-5} *4*; α(M)=4.9×10^{-6} *5* α(N)=1.51×10^{-7} *15* B(M1)(W.u.)=0.080 *+45−41*; B(E2)(W.u.)<122 E_γ: weighted average of 765.7 *5* from ^{63}Zn $\varepsilon+\beta^+$ decay, 765.0 *1* from (^{16}O,αpγ), 765.2 *3* from (^{18}O,αp2nγ), 765.5 *2* from (α,pnγ), and 765.5 *2* from (d,^{3}Heγ). Others: 764.9 *6* from (α,pγ) and 765.0 *16* from (n,n′γ). I_γ: unweighted average of 53 *20* from ^{63}Zn $\varepsilon+\beta^+$ decay, 76.9 *19* from (p,γ):E=res, 82.7 *23* from (n,n′γ), 90 *4* from (p,p′γ). Others: 110 *8* from (d,^{3}Heγ) and 12.4 *8* from (^{18}O,αp2nγ) are discrepant. Mult.: D(+Q) from $\gamma(\theta)$ in (α,pnγ); $\Delta\pi$=no from level scheme. δ: from (α,pnγ). Others: −0.10 *19* or +1.3 *+7−5* in (p,p′γ); −0.25 *+17−24* or +1.3 *+7−5* in (α,pγ).
		1130.08 *12*	100.0 *19*	962.145	5/2$^-$	M1+E2	−1.06 *+23−22*	0.000190 *4*	α(K)=0.000169 *4*; α(L)=1.67×10^{-5} *4*; α(M)=2.35×10^{-6} *5* α(N)=7.20×10^{-8} *15*; α(IPF)=1.69×10^{-6} *8* B(M1)(W.u.)=0.016 *+8−5*; B(E2)(W.u.)=24 *+10−8* E_γ: weighted average of 1130.67 *25* from ^{63}Zn $\varepsilon+\beta^+$ decay, 1130.0 *1* from (^{16}O,αpγ), 1129.9 *1* from (^{18}O,αp2nγ), 1130.4 *2* from (α,pnγ), and 1130.4 *2* from (d,^{3}Heγ). Other: 1130.0 *18* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 100 *4* from (^{18}O,αp2nγ), 100 *4* from (p,p′γ), 100 *8* from (d,^{3}Heγ), 100 *20* from

From ENSDF

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									^{63}Zn ε+β$^+$ decay and 100 *14* from (n,n′γ). Mult.: D+Q from γ(θ) in (α,pγ) and (α,pnγ); E1+M2 ruled out by RUL. δ: from (α,pγ). Other: −1.0 *4* in (α,pnγ).
2092.48	7/2$^-$	2093.0 *1*	19.5 *17*	0.0	3/2$^-$	E2		0.000415 *6*	B(E2)(W.u.)=0.41 *+16−10* α(K)=5.20×10^{-5} *7*; α(L)=5.10×10^{-6} *7*; α(M)=7.18×10^{-7} *10* α(N)=2.207×10^{-8} *31*; α(IPF)=0.000357 *5* E_γ: weighted average of 2092.6 *5* from ^{63}Zn ε+β$^+$ decay, 2092.5 *5* from (^{18}O,αp2nγ), 2093.1 *1* from (n,n′γ), and 2092.6 *5* from (d,^{3}Heγ). I_γ: weighted average of 23 *7* from ^{63}Zn ε+β$^+$ decay, 17.3 *19* from (p,γ):E=res, 20.4 *17* from (p,p′γ), and 34 *8* from (d,^{3}Heγ) Others: 7.1 *4* from (^{18}O,αp2nγ) and 11.4 *14* from (n,n′γ) are discrepant. Mult.: Q(+O) with δ=+10 *22*; M2,O components ruled out by RUL.
2207.84	9/2$^-$	881.0 *1*	100 *3*	1326.014	7/2$^-$	M1+E2	−0.28 *5*	0.000295 *5*	α(K)=0.000265 *4*; α(L)=2.62×10^{-5} *4*; α(M)=3.68×10^{-6} *6* α(N)=1.128×10^{-7} *17* B(M1)(W.u.)=0.056 *+11−13*; B(E2)(W.u.)=9.8 *+40−38* E_γ: from (^{16}O,αpγ). Others: 880.7 *5* from (^{18}O,αp2nγ), 881.3 *2* from (α,pnγ), 880.0 *16* from (n,n′γ), and 881.0 *1* from (p,p′γ). I_γ: from (α,pγ). Others: 100.0 *35* from (p,p′γ); I(881γ)/I(1245.4γ)=18.5/100 in (^{18}O,αp2nγ) and 30/100 in (^{16}O,αpγ) are discrepant. Mult.: D+Q from γ(θ) in (α,pγ) and (p,p′γ); E1+M2 ruled out by RUL. δ: from (α,pγ). Other: −0.24 *+6−8* or −2.0 *4* in (p,p′γ).
		1245.4 *2*	71.8 *31*	962.145	5/2$^-$	E2		0.0001783 *25*	B(E2)(W.u.)=17.1 *+34−40* α(K)=0.0001453 *20*; α(L)=1.435×10^{-5} *20*; α(M)=2.017×10^{-6} *28* α(N)=6.16×10^{-8} *9*; α(IPF)=1.661×10^{-5} *24* E_γ: unweighted average of 1246.0 *1* from (^{16}O,αpγ), 1245.5 *1* from (^{18}O,αp2nγ), 1245.0 *18* from (n,n′γ), and 1245.2 *2* from (p,p′γ). I_γ: weighted average of 69.5 *31* from (α,pγ) and 74.8 *35* from (p,p′γ). Mult.: Q(+O) with δ=−0.01 *+4−5* in (p,p′γ) and −0.05 *5* in (α,pγ), M2 and O components ruled out by RUL.
2274.7	(9/2$^-$)	948.2 *5*	100	1326.014	7/2$^-$	D+Q			E_γ,Mult.: from (^{18}O,αp2nγ).

From ENSDF

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
2336.48	$5/2^-$	475.0 *2*	7 *4*	1861.34	$7/2^-$	[M1]		1.11×10^{-3} *2*	α(K)=0.000992 *14*; α(L)=9.88×10^{-5} *14*; α(M)=1.390×10^{-5} *20* α(N)=4.24×10^{-7} *6* B(M1)(W.u.)=0.027 *+16−14* E_γ: from (n,n′γ). Other: 475.8 *9* from ^{63}Zn $\varepsilon+\beta^+$ decay.
		923.6 *3*	11.4 *14*	1412.124	$5/2^-$	[M1,E2]		0.000293 *31*	α(K)=0.000263 *28*; α(L)=2.61×10^{-5} *28*; α(M)=3.7×10^{-6} *4* α(N)=1.12×10^{-7} *11* E_γ: weighted average of 924.3 *5* from ^{63}Zn $\varepsilon+\beta^+$ decay and 923.5 *2* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 13.3 *25* from ^{63}Zn $\varepsilon+\beta^+$ decay, 12 *4* from (α,pγ), 11 *4* from (n,n′γ), and 10.6 *18* from (p,p′γ). B(M1)(W.u.)=0.0059 *16* if M1, B(E2)(W.u.)=11.9 *33* if E2.
		1374.54 *10*	34 *4*	962.145	$5/2^-$	(M1(+E2))		0.000166 *12*	α(K)=0.000113 *5*; α(L)=1.11×10^{-5} *5*; α(M)=1.56×10^{-6} *8* α(N)=4.78×10^{-8} *22*; α(IPF)=4.1×10^{-5} *6* E_γ: weighted average of 1374.44 *13* from ^{63}Zn $\varepsilon+\beta^+$ decay and 1374.6 *1* from (n,n′γ). I_γ: unweighted average of 43.6 *31* from ^{63}Zn $\varepsilon+\beta^+$ decay, 25 *4* from (α,pγ), 31.4 *29* from (p,γ):E=res, 29 *4* from (n,n′γ), and 41.4 *27* from (p,p′γ). Mult.: D(+Q) from $\gamma(\theta)$; $\Delta\pi$=no from level scheme. δ: +0.1 *+5−3* or +1.4 *+12−9* in (p,p′γ); −0.6 *+3−4* or >+3 in (α,pγ). B(M1)(W.u.)=0.0053 *14* if M1, B(E2)(W.u.)=4.9 *13* if E2.
		1667.2 *6*	1.8 *7*	669.724	$1/2^-$	[E2]		0.0002452 *34*	α(K)=7.97×10^{-5} *11*; α(L)=7.84×10^{-6} *11*; α(M)=1.102×10^{-6} *15* α(N)=3.38×10^{-8} *5*; α(IPF)=0.0001565 *22* B(E2)(W.u.)=0.099 *45*
		2336.5 *1*	100.0 *14*	0.0	$3/2^-$	(M1(+E2))		0.00049 *4*	E_γ,I_γ: from ^{63}Zn $\varepsilon+\beta^+$ decay. α(K)=4.21×10^{-5} *9*; α(L)=4.12×10^{-6} *9*; α(M)=5.79×10^{-7} *13* α(N)=1.79×10^{-8} *4*; α(IPF)=0.00044 *4* E_γ: from (n,n′γ). Others: 2336.6 *2* from ^{63}Zn $\varepsilon+\beta^+$ decay and 2336.2 *20* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Others: 100 *6* from ^{63}Zn $\varepsilon+\beta^+$ decay, 100 *6* from (α,pγ), 100 *4* from (n,n′γ), and 100 *4* from (p,p′γ). Mult.: D(+Q) from $\gamma(\theta)$; $\Delta\pi$=no from level scheme. δ: 0.00 *9* or −3.6 *+10−15* in (p,p′γ); +0.04 *7* or −2.6 *+8−12* in (α,pγ). B(M1)(W.u.)=0.0032 *8* if M1, B(E2)(W.u.)=1.01 *25* if E2.

From ENSDF

$^{63}_{29}Cu_{34}$-27

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	δ#	α†	Comments
2404.77	7/2−	992.4 *1*	50 *6*	1412.124	5/2−	M1+E2	−0.50 *+12−20*	0.000236 *7*	α(K)=0.000212 *6*; α(L)=2.09×10^{-5} *6*; α(M)=2.94×10^{-6} *8* α(N)=9.01×10^{-8} *25* B(M1)(W.u.)=0.031 *+7−10*; B(E2)(W.u.)=14 *+9−6* I_γ: others: 49 *7* from (α,pγ) and 51 *7* from (p,γ):E=res. Mult.,δ: D+Q and δ from (α,pγ); E1+M2 ruled out by RUL.
		1077.7 *1*	73 *5*	1326.014	7/2−	(M1(+E2))		0.000208 *16*	α(K)=0.000187 *14*; α(L)=1.85×10^{-5} *15*; α(M)=2.60×10^{-6} *20* α(N)=7.9×10^{-8} *6* E_γ: weighted average of 1077.6 *1* from (n,n′γ), 1077.8 *2* from (p,p′γ), and 1077.8 *4* from (d,^{3}Heγ). I_γ: weighted average of 83 *9* from (α,pγ), 81 *7* from (p,γ):E=res, 68 *6* from (n,n′γ), 68 *5* from (p,p′γ). Other: 133 *7* from (d,^{3}Heγ). Mult.: D(+Q) from γ(θ); Δπ=no from level scheme. δ: +0.07 *+29−19* or +0.92 *41* in (p,p′γ); −0.12 *21* in (α,pγ). B(M1)(W.u.)=0.044 *10* if M1, B(E2)(W.u.)=66 *+14−15* if E2.
		1442.7 *1*	100 *6*	962.145	5/2−	M1+E2		0.000172 *13*	α(K)=0.000102 *4*; α(L)=1.01×10^{-5} *4*; α(M)=1.42×10^{-6} *6* α(N)=4.34×10^{-8} *18*; α(IPF)=5.9×10^{-5} *8* E_γ: weighted average of 1442.8 *1* from (n,n′γ), 1442.7 *1* from (p,p′γ), and 1442.4 *3* from (d,^{3}Heγ). I_γ: from (p,p′γ). Others: 100 *9* from (α,pγ), 100 *9* from (p,γ):E=res, 100 *18* from (n,n′γ), 100 *6* from (d,^{3}Heγ). Mult.: D+Q from γ(θ); E1+M2 ruled out by RUL. δ: −0.24 *6* or −2.0 *+5−6* in (p,p′γ); −0.26 *+6−8* or −1.3 *+6−4* in (α,pγ). B(M1)(W.u.)=0.025 *6* if M1, B(E2)(W.u.)=21.0 *+45−48* if E2.
		2404.7 *2*	8.4 *27*	0.0	3/2−	E2		0.000554 *8*	B(E2)(W.u.)=0.14 *5* α(K)=4.07×10^{-5} *6*; α(L)=3.99×10^{-6} *6*; α(M)=5.61×10^{-7} *8* α(N)=1.727×10^{-8} *24*; α(IPF)=0.000509 *7* Mult.: Q from γ(θ) in (p,p′γ); M2 ruled out by RUL.
2430.37		570.0 *1*	52 *10*	1861.34	7/2−				
		884.0 *1*	100 *23*	1547.109	3/2−				
		1467.6 *1*	81 *29*	962.145	5/2−				
		2429.6 *2*	29 *10*	0.0	3/2−				
2497.26	(3/2)	1085.0 *1*	1.83 *25*	1412.124	5/2−				I_γ: from (p,γ):E=res. Other: 30 *7* from (n,n′γ) is discrepant.
		1535.0 *2*	2.92 *25*	962.145	5/2−				I_γ: from (p,γ):E=res. Other: 6.8 from (n,n′γ) is discrepant.

From ENSDF

$^{63}_{29}Cu_{34}$-28

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
2497.26	(3/2)	1827.7 *2*	17.2 *6*	669.724	1/2$^-$	D(+Q)		E_γ: weighted average of 1826.2 *8* from ^{63}Zn ε+β$^+$ decay and 1827.7 *1* from (n,n′γ). I_γ: weighted average of 23 *7* from ^{63}Zn ε+β$^+$ decay, 17.1 *4* from (p,γ):E=res, 30 *7* from (n,n′γ), and 20.1 *24* from (p,p′γ). δ: −7.1≤δ≤+0.4 from (p,p′γ).
		2497.2 *1*	100.0 *4*	0.0	3/2$^-$	D(+Q)		E_γ: from (n,n′γ). Others: 2497.5 *4* from ^{63}Zn ε+β$^+$ decay and 2497.8 *7* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Others: 100 *9* from ^{63}Zn ε+β$^+$ decay, 100 *12* from (n,n′γ), and 100.0 *24* from (p,p′γ). δ: −0.14 *+43−51* or E2, (p,p′γ).
2503.50		1541.5 *1*	100 *13*	962.145	5/2$^-$			
		2503.4 *1*	100 *13*	0.0	3/2$^-$			
2505.08	9/2$^+$	297.0 *1*	5.68 *32*	2207.84	9/2$^-$	[E1]	2.16×10^{-3} *3*	α(K)=0.001940 *27*; α(L)=0.0001921 *27*; α(M)=2.69×10^{-5} *4* α(N)=8.07×10^{-7} *11* B(E1)(W.u.)=2.34×10^{-4} *+39−42* E_γ: from (^{16}O,αpγ). Other: 297.3 *5* from (^{18}O,αp2nγ). I_γ: from (^{18}O,αp2nγ).
		413.4 *3*	74 *8*	2092.48	7/2$^-$	E1	0.000874 *12*	α(K)=0.000785 *11*; α(L)=7.76×10^{-5} *11*; α(M)=1.090×10^{-5} *15* α(N)=3.29×10^{-7} *5* B(E1)(W.u.)=0.00113 *+19−21* E_γ: unweighted average of 413.0 *1* from (^{16}O,αpγ), 412.9 *1* from (^{18}O,αp2nγ), 414.3 *4* from (α,pγ), 413.1 *2* from (α,pnγ), 414.0 *1* from (n,n′γ), and 412.8 *3* from (d,^{3}Heγ). I_γ: unweighted average of 79.8 *32* from (^{18}O,αp2nγ), 83 *5* from (α,pγ), 58 *5* from (n,n′γ). Other: 111 *8* from (d,^{3}Heγ). Mult.: from γγ(DCO) and γ(lin pol) in (^{18}O,αp2nγ),
		553.0 *1*	5.6	1952.03				E_γ,I_γ: from (^{16}O,αpγ) only.
		644.5 *2*	100 *4*	1861.34	7/2$^-$	E1	0.000292 *4*	B(E1)(W.u.)=4.0×10^{-4} *7* α(K)=0.000262 *4*; α(L)=2.59×10^{-5} *4*; α(M)=3.63×10^{-6} *5* α(N)=1.105×10^{-7} *15* E_γ: unweighted average of 644.0 *1* from (^{16}O,αpγ), 644.2 *1* from (^{18}O,αp2nγ), 645.4 *3* from (α,pγ), 644.4 *2* from (α,pnγ), 645.0 *1* from (n,n′γ), and 644.1 *3* from (d,^{3}Heγ). I_γ: from (^{18}O,αp2nγ). Others: 100 *5* from (α,pγ), 100 *10* from (n,n′γ), and 100 *8* from (d,^{3}Heγ).
		1178.7 *2*	66 *3*	1326.014	7/2$^-$	E1	0.0001230 *17*	Mult.: from γγ(DCO) and γ(lin pol) in (^{18}O,αp2nγ), α(K)=7.66×10^{-5} *11*; α(L)=7.51×10^{-6} *11*; α(M)=1.055×10^{-6} *15* α(N)=3.23×10^{-8} *5*; α(IPF)=3.79×10^{-5} *5*

From ENSDF

$^{63}_{29}Cu_{34}$-29

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								B(E1)(W.u.)=4.4×10^{-5} *+7−8* E_γ: unweighted average of 1179.0 *1* from (^{16}O,αpγ), 1178.3 *3* from (^{18}O,αp2nγ), 1178.9 *3* from (α,pγ), 1178.6 *2* from (α,pnγ), 1178.0 *1* from (n,n′γ), and 1179.1 *4* from (d,^{3}Heγ). I_γ: weighted average of 67.5 *25* from (α,pγ), 53 *10* from (n,n′γ), and 60 *8* from (d,^{3}Heγ). Other: 18.3 *10* from (^{18}O,αp2nγ) is discrepant. Mult.: E1+M2 from γ(lin pol) in (α,pγ); D, ΔJ=1 from γγ(DCO) in (^{18}O,αp2nγ).
2505.08	9/2$^+$	1543.0[b] *1*	9.8 *6*	962.145	5/2$^-$			E_γ: from (^{16}O,αpγ). Other: 1542.9 *3* from (^{18}O,αp2nγ). Mult.: Q from γγ(DCO) in (^{18}O,αp2nγ); M2 ruled out by RUL, but M2 from level scheme. This contradiction makes this γ questionable.
		2505.1 *5*	2.84 *32*	0.0	3/2$^-$	[E3]	0.000420 *6*	α(K)=5.82×10^{-5} *8*; α(L)=5.72×10^{-6} *8*; α(M)=8.04×10^{-7} *11* α(N)=2.472×10^{-8} *35*; α(IPF)=0.000355 *5* B(E3)(W.u.)=60 *12*
2511.903	(3/2)$^+$	1099.0[b] *2*	36 *4*	1412.124	5/2$^-$	[E1]		E_γ,I_γ: from (^{18}O,αp2nγ), B(E1)(W.u.)=5.4×10^{-4} *14* E_γ,I_γ: large intensity from (n,n′γ), but not seen in (p,γ):E=res, which makes this placement is questionable.
		1840.0 *2*	7.07 *22*	669.724	1/2$^-$	[E1]	0.000559 *8*	α(K)=3.66×10^{-5} *5*; α(L)=3.58×10^{-6} *5*; α(M)=5.03×10^{-7} *7* α(N)=1.547×10^{-8} *22*; α(IPF)=0.000519 *7* B(E1)(W.u.)=2.3×10^{-5} *6*
		2512.0 *1*	100.00 *22*	0.0	3/2$^-$	[E1]	0.000993 *14*	I_γ: from (p,γ):E=res. Other: 30 *4* from (n,n′γ) is discrepant. α(K)=2.328×10^{-5} *33*; α(L)=2.272×10^{-6} *32*; α(M)=3.19×10^{-7} *4* α(N)=9.84×10^{-9} *14*; α(IPF)=0.000968 *14* B(E1)(W.u.)=1.26×10^{-4} *31* E_γ: from (n,n′γ). Others: 2512.2 *5* from ^{63}Zn ε+β$^+$ decay and 2514.9 *26* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Other: 100 *12* from (n,n′γ).
2535.83	5/2$^-$	443.07 *20*	16.1 *32*	2092.48	7/2$^-$	[M1]	1.30×10^{-3} *2*	α(K)=0.001163 *16*; α(L)=0.0001160 *16*; α(M)=1.631×10^{-5} *23* α(N)=4.97×10^{-7} *7* B(M1)(W.u.)=0.048 *+19−18* E_γ: weighted average of 443.13 *20* from ^{63}Zn ε+β$^+$ decay and 443.0 *2* from (n,n′γ). I_γ: weighted average of 15 *4* from ^{63}Zn ε+β$^+$ decay and 16.8 *32* from (n,n′γ). Mult.: E2 ruled out by RUL.
		675.0 *2*	13.9 *30*	1861.34	7/2$^-$	[M1,E2]	0.00062 *12*	α(K)=0.00056 *11*; α(L)=5.6×10^{-5} *11*; α(M)=7.9×10^{-6} *15*

From ENSDF

$^{63}_{29}Cu_{34}$-30

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
							α(N)=2.4×10^{-7} *4* E_γ: from (n,n′γ). Other: 675.0 *6* from ^{63}Zn ε+β$^+$ decay. I_γ: weighted average of 13.3 *30* from ^{63}Zn ε+β$^+$ decay and 14.6 *32* from (n,n′γ).
2535.83	989.6 *7*	3.5 *10*	1547.109	3/2$^-$	[M1,E2]	0.000251 *23*	B(M1)(W.u.)=0.0118 *46* if M1, B(E2)(W.u.)=45 *18* if E2. α(K)=0.000225 *21*; α(L)=2.23×10^{-5} *21*; α(M)=3.13×10^{-6} *29* α(N)=9.6×10^{-8} *8* E_γ,I_γ: from ^{63}Zn ε+β$^+$ decay.
	1123.72 *7*	100 *5*	1412.124	5/2$^-$	[M1,E2]	0.000192 *14*	B(M1)(W.u.)=9.4×10^{-4} *+42−40* if M1, B(E2)(W.u.)=1.7 *7* if E2. α(K)=0.000171 *12*; α(L)=1.69×10^{-5} *12*; α(M)=2.37×10^{-6} *17* α(N)=7.3×10^{-8} *5*; α(IPF)=1.41×10^{-6} *25* E_γ: weighted average of 1123.73 *7* from ^{63}Zn ε+β$^+$ decay and 1123.7 *1* from (n,n′γ). I_γ: from (p,p′γ). Others: 100 *11* from ^{63}Zn ε+β$^+$ decay and 100 *22* from (n,n′γ).
	1208.7 *2*	11.4 *22*	1326.014	7/2$^-$	[M1,E2]	0.000172 *11*	B(M1)(W.u.)=0.018 *6* if M1, B(E2)(W.u.)=25 *8* if E2. α(K)=0.000146 *9*; α(L)=1.44×10^{-5} *9*; α(M)=2.03×10^{-6} *13* α(N)=6.2×10^{-8} *4*; α(IPF)=8.7×10^{-6} *14* E_γ: from (n,n′γ). Other: 1208.8 *3* from ^{63}Zn ε+β$^+$ decay. I_γ: from ^{63}Zn ε+β$^+$ decay. Other: 34 *6* from (n,n′γ) is discrepant.
	1573.39 *29*	14.1 *15*	962.145	5/2$^-$	[M1,E2]	0.000199 *16*	B(M1)(W.u.)=0.0017 *6* if M1, B(E2)(W.u.)=2.0 *8* if E2. α(K)=8.64×10^{-5} *31*; α(L)=8.49×10^{-6} *32*; α(M)=1.19×10^{-6} *4* α(N)=3.67×10^{-8} *13*; α(IPF)=0.000103 *13* E_γ: unweighted average of 1573.67 *20* from ^{63}Zn ε+β$^+$ decay and 1573.1 *2* from (n,n′γ). I_γ: from ^{63}Zn ε+β$^+$ decay. Others: 36 *4* from (n,n′γ), and 23.7 *32* from (p,p′γ) are discrepant.
	1865.9 *2*	25 *4*	669.724	1/2$^-$	[E2]	0.000319 *4*	B(M1)(W.u.)=9.4×10^{-4} *32* if M1, B(E2)(W.u.)=0.66 *23* if E2. α(K)=6.43×10^{-5} *9*; α(L)=6.31×10^{-6} *9*; α(M)=8.87×10^{-7} *12* α(N)=2.73×10^{-8} *4*; α(IPF)=0.0002470 *35* B(E2)(W.u.)=0.50 *18* E_γ: weighted average of 1865.7 *3* from ^{63}Zn ε+β$^+$ decay and 1866.0 *2* from (n,n′γ). I_γ: weighted average of 22 *4* from ^{63}Zn ε+β$^+$ decay and 28 *4* from (n,n′γ).
	2535.6 *5*	72 *6*	0.0	3/2$^-$	(M1(+E2))	0.00057 *4*	α(K)=3.66×10^{-5} *8*; α(L)=3.58×10^{-6} *8*; α(M)=5.04×10^{-7} *11* α(N)=1.553×10^{-8} *33*; α(IPF)=0.00053 *4* E_γ: unweighted average of 2536.0 *2* from ^{63}Zn ε+β$^+$ decay and 2535.1 *1* from (n,n′γ). I_γ: unweighted average of 61 *4* from ^{63}Zn ε+β$^+$ decay, 79 *11* from (n,n′γ), and

From ENSDF

$^{63}_{29}Cu_{34}$-31

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
									76 *4* from (p,p′γ). Mult.: D(+Q) from γ(θ) in (p,p′γ); Δπ=no from level scheme. δ: 0.0 *+3−5* or −3 *+2−26* from (p,p′γ). B(M1)(W.u.)=0.00115 *38* if M1, B(E2)(W.u.)=0.31 *10* if E2.
2547.55	9/2$^-$	686.5 *1*	100 *12*	1861.34	7/2$^-$	(M1(+E2))	−0.18 *+20−40*	0.00050 *5*	α(K)=0.00045 *4*; α(L)=4.4×10^{-5} *4*; α(M)=6.2×10^{-6} *6* α(N)=1.90×10^{-7} *18* E_γ: weighted average of 686.3 *2* from (α,pnγ) and 686.6 *1* from (n,n′γ). Mult.: D(+Q) from γ(θ) in (α,pnγ); Δπ=no from level scheme. δ: from (α,pnγ).
		1220.2 *2*	18 *6*	1326.014	7/2$^-$	[M1,E2]		0.000170 *11*	α(K)=0.000144 *9*; α(L)=1.42×10^{-5} *9*; α(M)=1.99×10^{-6} *12* α(N)=6.10×10^{-8} *35*; α(IPF)=1.03×10^{-5} *17*
		1585.4 *1*	26 *6*	962.145	5/2$^-$	[E2]		0.0002190 *31*	α(K)=8.80×10^{-5} *12*; α(L)=8.66×10^{-6} *12*; α(M)=1.217×10^{-6} *17* α(N)=3.73×10^{-8} *5*; α(IPF)=0.0001211 *17* E_γ: other: 1585.4 *2* from (α,pnγ).
2617.03		526.0 *1*	88	2092.48	7/2$^-$				E_γ,I_γ: from (^{16}O,αpγ).
		1291.0 *1*	100	1326.014	7/2$^-$				E_γ,I_γ: from (^{16}O,αpγ).
2630.96	1/2$^-$,3/2$^-$	1668.9 *1*	100 *12*	962.145	5/2$^-$				
		2630.3 *1*	26 *4*	0.0	3/2$^-$				
2672.51	5/2$^-$,7/2$^-$	811.5 *1*	100 *6*	1861.34	7/2$^-$	[M1,E2]		0.00040 *5*	α(K)=0.00036 *5*; α(L)=3.5×10^{-5} *5*; α(M)=5.0×10^{-6} *7* α(N)=1.51×10^{-7} *20* E_γ: from (n,n′γ). Other: 811.6 *3* from (d,^{3}Heγ). I_γ: (d,^{3}Heγ). Other: 100 *7* from (n,n′γ). B(M1)(W.u.)=0.084 *+37−22* if M1, B(E2)(W.u.)=2.2×10^2 *+10−6* if E2.
		1346.4[b] *2*	170 *6*	1326.014	7/2$^-$				E_γ,I_γ: from (d,^{3}Heγ) only.
		2673.6[b] *1*	472 *52*	0.0	3/2$^-$				E_γ,I_γ: from (n,n′γ) only.
2677.17	11/2$^-$	469.0 *3*	41.9 *29*	2207.84	9/2$^-$	M1(+E2)	+0.01 *3*	1.14×10^{-3} *2*	B(M1)(W.u.)=0.103 *+44−27*; B(E2)(W.u.)<1.8 α(K)=0.001021 *14*; α(L)=0.0001018 *14*; α(M)=1.431×10^{-5} *20*

From ENSDF

$^{63}_{29}Cu_{34}$-32

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.#	α†	Comments
								α(N)=4.36×10^{-7} *6* E_γ: unweighted average of 468.0 *1* from (^{16}O,αpγ), 469.4 *3* from (^{18}O,αp2nγ), 469.2 *4* from (α,pγ), 469.4 *2* from (α,pnγ), and 469.0 *1* from (n,n′γ). I_γ: weighted average of 42.9 *29* from (α,pγ), and 34 *8* from (n,n′γ). Mult.,δ: from γ(θ) and γ(lin pol) in (α,pγ). Other: δ(Q/D)=−0.07 *+10−30* from (α,pnγ).
2677.17	11/2$^-$	1350.1 *1*	100 *3*	1326.014	7/2$^-$	E2	0.0001764 *25*	B(E2)(W.u.)=9.8 *+32−20* α(K)=0.0001222 *17*; α(L)=1.205×10^{-5} *17*; α(M)=1.694×10^{-6} *24* α(N)=5.18×10^{-8} *7*; α(IPF)=4.04×10^{-5} *6* E_γ: weighted average of 1350.0 *1* from (^{16}O,αpγ), 1350.3 *3* from (^{18}O,αp2nγ), 1350.1 *4* from (α,pγ), 1350.7 *2* from (α,pnγ) and 1350.0 *1* from (n,n′γ). I_γ: from (α,pγ). Other: 100 *24* from (n,n′γ). Mult.: from γ(θ) and γ(lin pol) in (α,pγ).
2678.07	(5/2$^-$,7/2$^-$)	1131.0 *1*	100 *27*	1547.109	3/2$^-$			
		1716.8 *1*	59 *14*	962.145	5/2$^-$			
2682.45	(1/2$^-$,3/2$^-$)	2012.0 *1*	100 *27*	669.724	1/2$^-$			
		2682.5 *1*	59 *27*	0.0	3/2$^-$			
2696.69	1/2$^-$,3/2$^-$,5/2$^-$	685.6 *2*	8.2 *12*	2012.274	3/2$^-$	[M1,E2]	0.00060 *11*	α(K)=0.00054 *10*; α(L)=5.4×10^{-5} *10*; α(M)=7.5×10^{-6} *14* α(N)=2.3×10^{-7} *4* E_γ: from (n,n′γ). Other: 685.5 *6* from ^{63}Zn ε+β$^+$ decay. I_γ: weighted average of 34 *27* from ^{63}Zn ε+β$^+$ decay, 8.0 *11* from (p,γ):E=res, and 23 *12* from (n,n′γ). B(M1)(W.u.)=0.015 *6* if M1, B(E2)(W.u.)=53 *+22−20* if E2.
		1148.3 *13*	34.3 *17*	1547.109	3/2$^-$	[M1,E2]	0.000184 *13*	α(K)=0.000163 *11*; α(L)=1.61×10^{-5} *11*; α(M)=2.26×10^{-6} *16* α(N)=6.9×10^{-8} *5*; α(IPF)=2.6×10^{-6} *5* E_γ: unweighted average of 1149.52 *16* from ^{63}Zn ε+β$^+$ decay and 1147.0 *2* from (n,n′γ). I_γ: weighted average of 32 *4* from ^{63}Zn ε+β$^+$ decay, 34.1 *11* from (p,γ):E=res, 54 *10* from (n,n′γ), and 60 *14* from (p,p′γ). B(M1)(W.u.)=0.013 *5* if M1, B(E2)(W.u.)=17 *+7−6* if E2.
		2026.5 *1*	100.0 *22*	669.724	1/2$^-$	[M1,E2]	0.000356 *30*	α(K)=5.40×10^{-5} *14*; α(L)=5.30×10^{-6} *14*; α(M)=7.45×10^{-7} *19* α(N)=2.29×10^{-8} *6*; α(IPF)=0.000296 *28* E_γ: from (n,n′γ). Other: 2026.9 *3* from ^{63}Zn ε+β$^+$ decay. I_γ: from (p,γ):E=res. Others: 100 *7* from ^{63}Zn ε+β$^+$ decay, 100 *10* from (n,n′γ), and 100 *10* from (p,p′γ). B(M1)(W.u.)=0.0068 *+27−24* if M1, B(E2)(W.u.)=2.9 *+11−10* if E2.
		2696.5 *3*	72.6 *22*	0.0	3/2$^-$	[M1,E2]	0.00064 *4*	α(K)=3.30×10^{-5} *7*; α(L)=3.23×10^{-6} *7*; α(M)=4.54×10^{-7} *10* α(N)=1.401×10^{-8} *29*; α(IPF)=0.00060 *4*

From ENSDF

$^{63}_{29}Cu_{34}$-33

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								E_γ: weighted average of 2696.7 *2* from ^{63}Zn ε+β$^+$ decay and 2696.2 *2* from (n,n′γ).
								I_γ: weighted average of 66 *7* from ^{63}Zn ε+β$^+$ decay, 73.9 *22* from (p,γ):E=res, 62 *7* from (n,n′γ), and 77 *8* from (p,p′γ).
								B(M1)(W.u.)=0.0021 *+8−7* if M1, B(E2)(W.u.)=0.50 *+20−17* if E2.
2717.04	3/2$^-$,5/2$^-$	624.4 *1*	35 *8*	2092.48	7/2$^-$	[M1,E2]	0.00076 *16*	α(K)=0.00069 *15*; α(L)=6.8×10^{-5} *15*; α(M)=9.6×10^{-6} *21* α(N)=2.9×10^{-7} *6*
								E_γ: from (n,n′γ). Other: 624.3 *3* from ^{63}Zn ε+β$^+$ decay.
								I_γ: from ^{63}Zn ε+β$^+$ decay. Other: 217 *24* from (n,n′γ) is discrepant.
								B(M1)(W.u.)<0.1 if M1.
		1168.8 *8*	18 *7*	1547.109	3/2$^-$	[M1,E2]	0.000179 *12*	α(K)=0.000157 *10*; α(L)=1.55×10^{-5} *10*; α(M)=2.18×10^{-6} *15* α(N)=6.7×10^{-8} *4*; α(IPF)=4.2×10^{-6} *7*
								E_γ: unweighted average of 1169.6 *3* from ^{63}Zn ε+β$^+$ decay and 1168.0 *2* from (n,n′γ).
								I_γ: weighted average of 31 *10* from ^{63}Zn ε+β$^+$ decay, 35 *13* from (n,n′γ), and 12 *5* from (p,p′γ).
								B(M1)(W.u.)<0.0093 if M1, B(E2)(W.u.)<12 if E2.
		1389.68 *8*	100 *7*	1326.014	7/2$^-$	[M1,E2]	0.000167 *12*	α(K)=0.000110 *5*; α(L)=1.08×10^{-5} *5*; α(M)=1.53×10^{-6} *7* α(N)=4.68×10^{-8} *21*; α(IPF)=4.4×10^{-5} *6*
								E_γ: weighted average of 1389.66 *8* from ^{63}Zn ε+β$^+$ decay and 1389.7 *1* from (n,n′γ).
								I_γ: from (p,p′γ). Others: 100 *14* from ^{63}Zn ε+β$^+$ decay, 100 *24* from (n,n′γ).
								B(M1)(W.u.)<0.024 if M1, B(E2)(W.u.)<21 if E2.
		1754.9 *5*	9.9 *25*	962.145	5/2$^-$	[M1,E2]	0.000254 *22*	α(K)=7.03×10^{-5} *21*; α(L)=6.90×10^{-6} *22*; α(M)=9.70×10^{-7} *30* α(N)=2.98×10^{-8} *9*; α(IPF)=0.000176 *20*
								I_γ: weighted average of 10.8 *25* from ^{63}Zn ε+β$^+$ decay and 8.9 *25* from (p,p′γ).
								B(M1)(W.u.)<0.0014 if M1, B(E2)(W.u.)<0.8 if E2.
		2047.3 *2*	10 *3*	669.724	1/2$^-$	[M1,E2]	0.000365 *30*	α(K)=5.31×10^{-5} *13*; α(L)=5.20×10^{-6} *13*; α(M)=7.31×10^{-7} *19* α(N)=2.25×10^{-8} *5*; α(IPF)=0.000306 *29*
								E_γ: from (n,n′γ). Other: 2047.0 *8* from ^{63}Zn ε+β$^+$ decay.
								I_γ: weighted average of 13.1 *23* from ^{63}Zn ε+β$^+$ decay and 7.4 *21* from (p,p′γ). Other: 59 *13* from (n,n′γ),
								B(M1)(W.u.)<9.4×10^{-4} if M1, B(E2)(W.u.)<0.39 if E2.
		2716.3 *2*	29.5 *25*	0.0	3/2$^-$	[M1,E2]	0.00065 *4*	α(K)=3.26×10^{-5} *7*; α(L)=3.19×10^{-6} *7*; α(M)=4.49×10^{-7} *9* α(N)=1.384×10^{-8} *28*; α(IPF)=0.00061 *4*
								E_γ: weighted average of 2717.0 *4* from ^{63}Zn ε+β$^+$ decay and 2716.3 *1*

From ENSDF

$^{63}_{29}Cu_{34}$-34

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								from (n,n′γ). I_γ: weighted average of 29.2 *25* from ^{63}Zn ε+β$^+$ decay and 29.9 *34* from (p,p′γ). Other: 124 *24* from (n,n′γ). B(M1)(W.u.)<9.9×10^{-4} if M1, B(E2)(W.u.)<0.23 if E2.
2764.56		903.0 *1*	100 *24*	1861.34	7/2$^-$			
		1437.4 *1*	88 *24*	1326.014	7/2$^-$			
		1802.4 *1*	≈52	962.145	5/2$^-$			
2775.84	(3/2$^-$)	1813.7 *1*	100 *18*	962.145	5/2$^-$			
		2107.0 *1*	39 *11*	669.724	1/2$^-$			
2780.36	(3/2$^-$)	244.3 *5*	35 *6*	2535.83	5/2$^-$	[M1]	0.00534 *8*	α(K)=0.00479 *7*; α(L)=0.000483 *7*; α(M)=6.80×10^{-5} *10* α(N)=2.054×10^{-6} *31* E_γ,I_γ: from ^{63}Zn ε+β$^+$ decay only. Mult.: for the adopted branching ratio and $T_{1/2}$, none of E1, M1, E2, or their mixture are allowed by RUL: B(M1)(W.u.)=5.5 *+19–16* exceeds RUL=3 if M1; B(E2)(W.u.)=1.6×10^5 *+5–6* greatly exceeds RUL=300 if E2; B(E1)(W.u.)=0.106 *+30–42* exceeds RUL=0.01. Further investigation is needed for the placement and branching ratio of this transition. If the placement is correct, it is mostly likely M1 based on RUL.
		718.17	6.5 *5*	2062.45	(3/2)$^-$	[M1,E2]	0.00053 *9*	α(K)=0.00048 *8*; α(L)=4.8×10^{-5} *8*; α(M)=6.7×10^{-6} *12* α(N)=2.03×10^{-7} *33* E_γ,I_γ: from (p,γ):E=res. B(M1)(W.u.)=0.040 *+13–11* if M1, B(E2)(W.u.)=134 *+44–37* if E2.
		1233.1 *7*	22.2 *18*	1547.109	3/2$^-$	[M1,E2]	0.000169 *11*	α(K)=0.000141 *8*; α(L)=1.39×10^{-5} *8*; α(M)=1.95×10^{-6} *12* α(N)=5.97×10^{-8} *34*; α(IPF)=1.23×10^{-5} *20* E_γ: unweighted average of 1233.7 *5* from ^{63}Zn ε+β$^+$ decay and 1232.4 *2* from (n,n′γ). I_γ: weighted average of 16 *6* from ^{63}Zn ε+β$^+$ decay, 22.8 *18* from (p,γ):E=res, and 22 *4* from (p,p′γ). B(M1)(W.u.)=0.027 *+9–8* if M1, B(E2)(W.u.)=31 *+10–9* if E2.
		2110.1 *3*	46.3 *18*	669.724	1/2$^-$	[M1,E2]	0.000391 *32*	α(K)=5.03×10^{-5} *12*; α(L)=4.93×10^{-6} *12*; α(M)=6.93×10^{-7} *17* α(N)=2.13×10^{-8} *5*; α(IPF)=0.000335 *31* E_γ: weighted average of 2110.7 *5* from ^{63}Zn ε+β$^+$ decay and 2110.0 *2* from (n,n′γ). I_γ: weighted average of 42 *8* from ^{63}Zn ε+β$^+$ decay, 45.6 *18* from (p,γ):E=res, and 49.8 *35* from (p,p′γ). B(M1)(W.u.)=0.0112 *+36–30* if M1, B(E2)(W.u.)=4.4 *+14–12* if E2.
		2780.1 *2*	100.0 *18*	0.0	3/2$^-$	[M1,E2]	0.00067 *5*	α(K)=3.14×10^{-5} *7*; α(L)=3.07×10^{-6} *6*; α(M)=4.32×10^{-7} *9* α(N)=1.332×10^{-8} *27*; α(IPF)=0.00064 *4* E_γ: weighted average of 2780.5 *3* from ^{63}Zn ε+β$^+$ decay and 2780.0 *1* from (n,n′γ).

From ENSDF

$^{63}_{29}Cu_{34}$-35

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								I_γ: from (p,γ):E=res. Others: 100 *8* from ^{63}Zn ε+β$^+$ decay, 100 *16* from (n,n′γ), and 100 *4* from (p,p′γ). B(M1)(W.u.)=0.0106 *+34−28* if M1, B(E2)(W.u.)=2.4 *+8−6* if E2.
2808.14	3/2$^-$	1261.0 *2*		1547.109	3/2$^-$			
		1480.1 *10*	42 *4*	1326.014	7/2$^-$	[E2]	0.0001918 *27*	α(K)=0.0001010 *14*; α(L)=9.95×10^{-6} *14*; α(M)=1.398×10^{-6} *20* α(N)=4.28×10^{-8} *6*; α(IPF)=7.94×10^{-5} *12* B(E2)(W.u.)<7.8 E_γ: unweighted average of 1479.1 *5* from ^{63}Zn ε+β$^+$ decay and 1481.0 *2* from (n,n′γ). I_γ: weighted average of 37 *4* from (p,γ):E=res, 47 *16* from (n,n′γ), and 49 *5* from (p,p′γ). Other: 54 *27* from ^{63}Zn ε+β$^+$ decay.
		2138.3 *2*	32	669.724	1/2$^-$	[M1,E2]	0.000403 *33*	α(K)=4.91×10^{-5} *12*; α(L)=4.81×10^{-6} *12*; α(M)=6.77×10^{-7} *17* α(N)=2.08×10^{-8} *5*; α(IPF)=0.000348 *32* B(M1)(W.u.)<0.0026 if M1, B(E2)(W.u.)<1.0 if E2.
		2807.4 *7*	100 *4*	0.0	3/2$^-$	[M1,E2]	0.00069 *5*	α(K)=3.09×10^{-5} *6*; α(L)=3.02×10^{-6} *6*; α(M)=4.25×10^{-7} *9* α(N)=1.311×10^{-8} *27*; α(IPF)=0.00065 *4* E_γ: unweighted average of 2806.7 *4* from ^{63}Zn ε+β$^+$ decay and 2808.1 *1* from (n,n′γ). I_γ: from (p,γ):E=res. Others: 100 *19* from ^{63}Zn ε+β$^+$ decay, 100 *32* from (n,n′γ), and 100 *5* from (p,p′γ). B(M1)(W.u.)<0.0033 if M1, B(E2)(W.u.)<0.71 if E2.
2818.87		2818.8 *2*	100	0.0	3/2$^-$			
2832.95	(7/2$^-$)	971.8 *2*	100.0 *13*	1861.34	7/2$^-$	[M1,E2]	0.000261 *25*	α(K)=0.000235 *22*; α(L)=2.32×10^{-5} *23*; α(M)=3.27×10^{-6} *32* α(N)=1.00×10^{-7} *9* E_γ,I_γ: from (d,^{3}Heγ) only. B(M1)(W.u.)=0.091 *+38−23* if M1, B(E2)(W.u.)=1.7×10^2 *+7−4* if E2.
		1505.6 *3*	31.6 *13*	1326.014	7/2$^-$	[M1,E2]	0.000183 *14*	α(K)=9.4×10^{-5} *4*; α(L)=9.3×10^{-6} *4*; α(M)=1.30×10^{-6} *5* α(N)=4.00×10^{-8} *15*; α(IPF)=7.8×10^{-5} *10* E_γ,I_γ: from (d,^{3}Heγ) only. B(M1)(W.u.)=0.0077 *+32−20* if M1, B(E2)(W.u.)=5.9 *+24−15* if E2.
		2831.2[b]		0.0	3/2$^-$			E_γ: from (p,γ):E=res only, as the only transition seen from the 2832 level, which is however not seen in (d,^{3}Heγ). This makes either this placement of this transition questionable or the two levels different.
2835.83	(5/2$^-$)	976.0 *2*	41 *14*	1861.34	7/2$^-$			
		2166.0 *1*	100 *14*	669.724	1/2$^-$			
		2837.5 *1*	59 *14*	0.0	3/2$^-$			
2857.55	(1/2$^-$,3/2$^-$)	1446.4 *2*	89 *3*	1412.124	5/2$^-$	[M1,E2]	0.000173 *13*	α(K)=0.000102 *4*; α(L)=1.00×10^{-5} *4*; α(M)=1.41×10^{-6} *6* α(N)=4.33×10^{-8} *18*; α(IPF)=5.9×10^{-5} *8* B(E2)(W.u.)=5 *+5−3* E_γ: weighted average of 1445.8 *4* from ^{63}Zn ε+β$^+$ decay and 1446.4

From ENSDF

$^{63}_{29}Cu_{34}$-36

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								1 from (n,n′γ).
								I_γ: weighted average of 88.6 *29* from (p,γ):E=res, 86 *29* from ^{63}Zn ε+β^+ decay, and 100 *16* from (n,n′γ).
2857.55	(1/2$^-$,3/2$^-$)	1896.0 *1*	31 *6*	962.145	5/2$^-$	[M1,E2]	0.000305 *26*	α(K)=6.09×10^{-5} *17*; α(L)=5.98×10^{-6} *17*; α(M)=8.41×10^{-7} *24* α(N)=2.59×10^{-8} *7*; α(IPF)=0.000237 *25* B(E2)(W.u.)=0.43 *+46−24* I_γ: weighted average of 31 *6* from (p,γ):E=res and 31 *14* from (p,p′γ). Other: 132 *16* from (n,n′γ) is discrepant.
		2187.0 *10*	63 *3*	669.724	1/2$^-$	[M1,E2]	0.000423 *34*	α(K)=4.72×10^{-5} *11*; α(L)=4.63×10^{-6} *11*; α(M)=6.50×10^{-7} *16* α(N)=2.00×10^{-8} *5*; α(IPF)=0.000370 *33* E_γ: unweighted average of 2188.0 *7* from ^{63}Zn ε+β^+ decay and 2186.0 *2* from (n,n′γ). I_γ: weighted average of 62.9 *29* from (p,γ):E=res, 47 *16* from (n,n′γ), 64 *11* from (p,p′γ), and 57 *29* from ^{63}Zn ε+β^+ decay. B(M1)(W.u.)=0.0012 *+13−7* if M1, B(E2)(W.u.)=0.42 *+45−23* if E2.
		2858.5 *1*	100 *3*	0.0	3/2$^-$	[M1,E2]	0.00071 *5*	α(K)=3.00×10^{-5} *6*; α(L)=2.93×10^{-6} *6*; α(M)=4.12×10^{-7} *9* α(N)=1.272×10^{-8} *26*; α(IPF)=0.00067 *5* E_γ: from (n,n′γ). Others: 2857.7 *7* from ^{63}Zn ε+β^+ decay and 2858.0 *6* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Others: 100 *17* from ^{63}Zn ε+β^+ decay, 100 *16* from (n,n′γ), and 100 *14* from (p,p′γ). B(M1)(W.u.)=8×10^{-4} *+9−5* if M1, B(E2)(W.u.)=0.18 *+19−10* if E2.
2889.29	(1/2$^-$,3/2,5/2$^-$)	807.96	19.2 *19*	2081.32	5/2$^-$			E_γ,I_γ: from (p,γ):E=res.
		1926.7 *1*	100 *4*	962.145	5/2$^-$			E_γ: from (n,n′γ). Other: 1927.0 *7* from ^{63}Zn ε+β^+ decay. I_γ: from (p,γ):E=res. Others: 100 *16* from ^{63}Zn ε+β^+ decay, 100 *16* from (n,n′γ), and 100 *9* from (p,p′γ).
		2219.1 *3*	31.1 *27*	669.724	1/2$^-$			E_γ: weighted average of 2219.9 *7* from ^{63}Zn ε+β^+ decay and 2219.0 *2* from (n,n′γ). I_γ: unweighted average of 52 *15* from ^{63}Zn ε+β^+ decay, 30.8 *19* from (p,γ):E=res. Other: 16 *5* from (n,n′γ) is discrepant.
		2889.1 *2*	37 *4*	0.0	3/2$^-$			E_γ: weighted average of 2889.6 *5* from ^{63}Zn ε+β^+ decay and 2889.0 *2* from (n,n′γ). I_γ: weighted average of 38 *5* from ^{63}Zn ε+β^+ decay, 42 *4* from (p,γ):E=res, and 28 *5* from (p,p′γ). Other: 16.3 *32* from (n,n′γ) is discrepant.
2911.04		406.0 *1*	100	2505.08	9/2$^+$			E_γ: from (^{16}O,αpγ).
2958.90		944.0 *1*	84 *16*	2012.274	3/2$^-$			
		1996.8 *1*	84 *16*	962.145	5/2$^-$			
		2956.0 *1*	100 *11*	0.0	3/2$^-$			
2976.94	1/2$^-$,3/2$^-$,5/2$^-$	2308.0 *2*	17.7 *12*	669.724	1/2$^-$			I_γ: from (p,γ):E=res. Other: 67 from (n,n′γ).

From ENSDF

$^{63}_{29}Cu_{34}$-37

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
2976.94	1/2$^-$,3/2$^-$,5/2$^-$	2976.8 *2*	100.0 *12*	0.0	3/2$^-$			I_γ: from (p,γ):E=res. Other: 100 *33* from (n,n′γ).
3032.17	3/2$^-$	1706.6 *1*	74 *8*	1326.014	7/2$^-$			
		2070.0 *2*	24 *10*	962.145	5/2$^-$			
		3032.1 *1*	100 *19*	0.0	3/2$^-$			
3044.52	(5/2)$^-$	547.26	9.0 *13*	2497.26	(3/2)			E_γ,I_γ: from (p,γ):E=res.
		1497.39	10.3 *13*	1547.109	3/2$^-$			E_γ,I_γ: from (p,γ):E=res.
		2372.6 *1*	7.7 *13*	669.724	1/2$^-$			I_γ: from (p,γ):E=res.
		3043.5 *10*	100.0 *13*	0.0	3/2$^-$			E_γ: unweighted average of 3044.4 *7* from ^{63}Zn ε+β^+ decay and 3042.5 *1* from (n,n′γ). I_γ: from (p,γ):E=res. Other: I(3043γ)/I(2373γ)=55 *10*/100 *24* is discrepant.
3095.21	(1/2,3/2,5/2$^-$)	2425.5 *2*	31 *16*	669.724	1/2$^-$			
		3095.1 *1*	100 *23*	0.0	3/2$^-$			
3100.54	1/2$^-$,3/2$^-$	2430.77	81.8 *18*	669.724	1/2$^-$			E_γ,I_γ: from (p,γ):E=res.
		3100.8 *7*	100.0 *18*	0.0	3/2$^-$			E_γ: weighted average of 3100.7 *7* from ^{63}Zn ε+β^+ decay and 3100.9 *10* from (n,n′γ). I_γ: from (p,γ):E=res.
3128.1	$^-$	1117.4	100	2012.274	3/2$^-$			E_γ: from (p,γ):E=res. Other: 1119.0 *18* for a doublet in (n,n′γ).
3225.3	5/2$^-$	2555.5[&]	100[&]	669.724	1/2$^-$			
		3225.2[&]	52[&]	0.0	3/2$^-$			E_γ: other: 3222 *3* from (n,n′γ).
3248	(5/2)	2578 *3*	100	669.724	1/2$^-$			
3263.7	(5/2$^-$)	2593.8[&]	67[&]	669.724	1/2$^-$			
		3263.5[&]	100[&]	0.0	3/2$^-$			
3292.4	(3/2$^+$,5/2$^+$)	3292.3	100	0.0	3/2$^-$			
3295.00	(11/2$^+$)	618.0 *1*	63	2677.17	11/2$^-$			E_γ,I_γ: from (^{16}O,αpγ).
		790.0 *1*	100	2505.08	9/2$^+$			E_γ,I_γ: from (^{16}O,αpγ).
		1087.0 *1*	25	2207.84	9/2$^-$			E_γ,I_γ: from (^{16}O,αpγ).
3297.62	3/2$^-$	2627.7 *1*	100 *4*	669.724	1/2$^-$	[M1,E2]	0.00061 *4*	α(K)=3.45×10^{-5} *7*; α(L)=3.37×10^{-6} *7*; α(M)=4.74×10^{-7} *10* α(N)=1.463×10^{-8} *30*; α(IPF)=0.00057 *4* E_γ: from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Other: 100 *8* from (d,^{3}Heγ). B(M1)(W.u.)=0.06 +*7*−*3* if M1, B(E2)(W.u.)=14 +*16*−*7* if E2.
		3297.4 *17*	38 *10*	0.0	3/2$^-$	[M1,E2]	0.00088 *5*	α(K)=2.38×10^{-5} *5*; α(L)=2.33×10^{-6} *5*; α(M)=3.28×10^{-7} *7* α(N)=1.011×10^{-8} *20*; α(IPF)=0.00086 *5* E_γ: from (d,^{3}Heγ). I_γ: unweighted average of 28.2 *26* from (p,γ):E=res and 47 *8* from (d,^{3}Heγ). B(M1)(W.u.)=0.011 +*13*−*6* if M1, B(E2)(W.u.)=1.7 +*20*−*9* if E2.
3307.03	(3/2$^+$)	1244.83[&]	91[&] *6*	2062.45	(3/2)$^-$			

From ENSDF

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
3307.03	(3/2$^+$)	1295.74[&]	43.8[&] *31*	2012.274	3/2$^-$				
		2344.84[&]	100[&] *6*	962.145	5/2$^-$				
		2637.25[&]	46.9[&] *31*	669.724	1/2$^-$				
		3306.94[&]	25[&] *6*	0.0	3/2$^-$				
3309.6	(3/2$^+$,5/2$^+$)	1762.5[&]	100[&]	1547.109	3/2$^-$				
		3309.5[&]	100[&]	0.0	3/2$^-$				
3404.41	(1/2 to 7/2)	3404.31	100	0.0	3/2$^-$				E_γ: from (p,γ):E=res.
3418.16	(1/2 to 7/2)	920.89[&]	61.3[&] *16*	2497.26	(3/2)				
		3418.06[&]	100.0[&] *16*	0.0	3/2$^-$				E_γ: other: 3418 *3* from (n,n′γ).
3426.0	1/2$^-$,3/2$^-$	2756 *3*	68 *16*	669.724	1/2$^-$				
		3426 *3*	100 *32*	0.0	3/2$^-$				
3429.80	(3/2)$^-$	2467.60[&] *3*	23.5[&] *13*	962.145	5/2$^-$				E_γ: other: 2468 *3* from (n,n′γ).
		3429.70[&]	100.0[&] *13*	0.0	3/2$^-$				
3461.17	11/2$^+$	955.8 *2*	100	2505.08	9/2$^+$	M1+E2	−0.42 *4*	0.000253 *4*	α(K)=0.0002271 *34*; α(L)=2.242×10^{-5} *34*; α(M)=3.15×10^{-6} *5* α(N)=9.66×10^{-8} *14* B(M1)(W.u.)=0.11 *+11−6*; B(E2)(W.u.)=36 *+39−20* E_γ: unweighted average of 956.0 *1* from (^{16}O,αpγ), 955.4 *1* from (^{18}O,αp2nγ), 956.1 *5* from (α,pγ), 955.5 *2* from (α,pnγ). Mult.,δ: from γ(θ) and γ(lin pol) in (α,pγ). Other: −0.8 *+2−4* from γ(θ) in (α,pnγ).
3461.3	5/2$^+$	955.0 *17*	100	2505.08	9/2$^+$				
		3461.2[b]		0.0	3/2$^-$				E_γ: reported in (p,γ):E=res, but not seen in (n,n′γ).
3465.00	1/2$^-$,3/2$^-$	2795.21[&]	85.5[&] *18*	669.724	1/2$^-$	[M1,E2]		0.00068 *5*	α(K)=3.11×10^{-5} *6*; α(L)=3.04×10^{-6} *6*; α(M)=4.28×10^{-7} *9* α(N)=1.320×10^{-8} *27*; α(IPF)=0.00065 *4* B(M1)(W.u.)=0.007 *+10−4* if M1, B(E2)(W.u.)=1.5 *+21−9* if E2.
		3465.2[&] *19*	100[&] *4*	0.0	3/2$^-$	[M1,E2]		0.00095 *5*	α(K)=2.21×10^{-5} *4*; α(L)=2.15×10^{-6} *4*; α(M)=3.03×10^{-7} *6* α(N)=9.35×10^{-9} *19*; α(IPF)=0.00092 *5* E_γ: other: 3465.2 *19* from (n,n′γ). B(M1)(W.u.)=0.004 *+6−3* if M1, B(E2)(W.u.)=0.6 *+8−4* if E2.
3474.59	5/2$^+$	3474.49 *3*	100	0.0	3/2$^-$				E_γ: from (p,γ):E=res. Other: 3475 *3* from (n,n′γ).
3541.3	(1/2$^-$ to 7/2)	2579.1[&]	49[&] *8*	962.145	5/2$^-$				

From ENSDF

$^{63}_{29}Cu_{34}$-39

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
3541.3	(1/2$^-$ to 7/2)	3541.2[&]	100[&] *14*	0.0	3/2$^-$			
3556.8	(11/2$^-$)	1008.9 *5*	100	2547.55	9/2$^-$			
3565.6		3565 *3*	100	0.0	3/2$^-$			
3569.47		3569.36	100	0.0	3/2$^-$			
3580.71	1/2$^-$,3/2$^-$	2910.0 *6*	100 *5*	669.724	1/2$^-$	[M1,E2]	0.00073 *5*	α(K)=2.91×10^{-5} *6*; α(L)=2.85×10^{-6} *6*; α(M)=4.01×10^{-7} *8* α(N)=1.236×10^{-8} *25*; α(IPF)=0.00070 *5* E_γ: from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Other: 100 *9* from (d,^{3}Heγ). B(M1)(W.u.)=0.10 *+18−7* if M1, B(E2)(W.u.)=21 *+37−13* if E2.
		3580.6	72 *13*	0.0	3/2$^-$	[M1,E2]	0.00099 *5*	α(K)=2.10×10^{-5} *4*; α(L)=2.05×10^{-6} *4*; α(M)=2.88×10^{-7} *6* α(N)=8.89×10^{-9} *18*; α(IPF)=0.00096 *5* E_γ: from (p,γ):E=res. Other: 3574.2 *24* from (d,^{3}Heγ). I_γ: unweighted average of 59 *5* from (p,γ):E=res and 85 *9* from (d,^{3}Heγ). B(M1)(W.u.)=0.04 *+7−3* if M1, B(E2)(W.u.)=5 *+9−4* if E2.
3583.3	(5/2$^-$,7/2$^-$)	2256.2 *9*	92 *8*	1326.014	7/2$^-$	[M1,E2]	0.00045 *4*	α(K)=4.47×10^{-5} *10*; α(L)=4.38×10^{-6} *10*; α(M)=6.16×10^{-7} *14* α(N)=1.90×10^{-8} *4*; α(IPF)=0.000402 *35* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.009 *+10−5* if M1, B(E2)(W.u.)=3.1 *+32−16* if E2.
		2621.5 *8*	100 *8*	962.145	5/2$^-$	[M1,E2]	0.00061 *4*	α(K)=3.46×10^{-5} *7*; α(L)=3.39×10^{-6} *7*; α(M)=4.76×10^{-7} *10* α(N)=1.468×10^{-8} *30*; α(IPF)=0.00057 *4* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.006 *+7−3* if M1, B(E2)(W.u.)=1.6 *+17−8* if E2.
3607	5/2$^-$,7/2$^-$	3607 *3*	100	0.0	3/2$^-$			
3647.51	(1/2,3/2,5/2$^-$)	1585.30[&]	8.2[&] *6*	2062.45	(3/2)$^-$			
		2977.71[&]	100[&] *7*	669.724	1/2$^-$			
3656.8	(1/2,3/2,5/2$^-$)	3656.7	100	0.0	3/2$^-$			E_γ: from (p,γ):E=res. Other: 3659 *3* from (n,n′γ).
3681.0	5/2$^-$,7/2$^-$	2718.8 *7*	100	962.145	5/2$^-$	[M1,E2]	0.00065 *4*	α(K)=3.26×10^{-5} *7*; α(L)=3.19×10^{-6} *7*; α(M)=4.48×10^{-7} *9* α(N)=1.382×10^{-8} *28*; α(IPF)=0.00061 *4* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.017 *+10−6* if M1, B(E2)(W.u.)=4.1 *+23−13* if E2.
3719.04	(1/2,3/2)$^+$	2756.83[&]	92.1[&] *26*	962.145	5/2$^-$			
		3049.24[&]	100.0[&] *26*	669.724	1/2$^-$			
		3718.92[&]	23.7[&] *26*	0.0	3/2$^-$			
3737.3	(13/2$^-$)	1529.7 *5*	100	2207.84	9/2$^-$	Q		E_γ: from (^{18}O,αp2nγ).
3740.19	(3/2,5/2)$^+$	2193.04	56.3 *31*	1547.109	3/2$^-$			
		3740.07	100.0 *31*	0.0	3/2$^-$			
3774.43	(1/2,3/2,5/2$^-$)	1712.22[&]	41[&] *4*	2062.45	(3/2)$^-$			

From ENSDF

$^{63}_{29}Cu_{34}$-40

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
3774.43	(1/2,3/2,5/2$^-$)	3774.31[&]	100[&] *4*	0.0	3/2$^-$			
3775.2	5/2$^-$,7/2$^-$	1437.6 *5*	68 *5*	2336.48	5/2$^-$	[M1,E2]	0.000172 *13*	α(K)=0.000103 *4*; α(L)=1.01×10^{-5} *5*; α(M)=1.43×10^{-6} *6* α(N)=4.38×10^{-8} *18*; α(IPF)=5.7×10^{-5} *8* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.017 *+7−5* if M1, B(E2)(W.u.)=14 *+6−4* if E2.
		1913.0 *6*	83 *8*	1861.34	7/2$^-$	[M1,E2]	0.000311 *27*	α(K)=6.00×10^{-5} *16*; α(L)=5.88×10^{-6} *16*; α(M)=8.27×10^{-7} *23* α(N)=2.55×10^{-8} *7*; α(IPF)=0.000245 *25* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.0090 *+36−26* if M1, B(E2)(W.u.)=4.2 *+17−12* if E2.
		2448.9 *5*	100 *5*	1326.014	7/2$^-$	[M1,E2]	0.00053 *4*	α(K)=3.88×10^{-5} *9*; α(L)=3.80×10^{-6} *8*; α(M)=5.34×10^{-7} *12* α(N)=1.647×10^{-8} *35*; α(IPF)=0.00049 *4* E_γ,I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.0052 *+21−14* if M1, B(E2)(W.u.)=1.5 *+6−4* if E2.
3785.53	1/2$^-$,3/2$^-$	1103.07[&]	10.8[&] *8*	2682.45	(1/2$^-$,3/2$^-$)			
		1774.23[&]	5.8[&] *10*	2012.274	3/2$^-$			
		2373.36[&]	38[&] *2*	1412.124	5/2$^-$			
		2823.32[&]	28[&] *2*	962.145	5/2$^-$			
		3115.72[&]	100[&] *2*	669.724	1/2$^-$			
3866.55	(1/2$^-$ to 7/2)	2904.33[&]	100	962.145	5/2$^-$			
3888.8	5/2$^-$,7/2$^-$	2562.0 *7*	100 *9*	1326.014	7/2$^-$	[M1,E2]	0.00058 *4*	α(K)=3.60×10^{-5} *8*; α(L)=3.52×10^{-6} *8*; α(M)=4.95×10^{-7} *11* α(N)=1.526×10^{-8} *32*; α(IPF)=0.00054 *4* E_γ,I_γ: from (d,^{3}Heγ) only; not seen in (n,n′γ). B(M1)(W.u.)=0.0065 *+44−26* if M1, B(E2)(W.u.)=1.7 *+12−7* if E2.
		2926.2 *13*	70 *9*	962.145	5/2$^-$	[M1,E2]	0.00074 *5*	α(K)=2.89×10^{-5} *6*; α(L)=2.82×10^{-6} *6*; α(M)=3.97×10^{-7} *8* α(N)=1.225×10^{-8} *25*; α(IPF)=0.00070 *5* E_γ: weighted average of 2928 *3* from (n,n′γ) and 2925.9 *13* from (d,^{3}Heγ). I_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.0030 *+21−12* if M1, B(E2)(W.u.)=0.61 *+42−25* if E2.
		3889 *3*		0.0	3/2$^-$			E_γ,I_γ: from (n,n′γ) only, I(3889γ)/I(2928γ)=100 *57*/186 *72*.
3895.1	5/2$^-$,7/2$^-$	3895.0 *9*	100	0.0	3/2$^-$	[M1,E2]	0.00110 *5*	α(K)=1.84×10^{-5} *4*; α(L)=1.80×10^{-6} *4*; α(M)=2.53×10^{-7} *5* α(N)=7.81×10^{-9} *16*; α(IPF)=0.00108 *5*

From ENSDF

$^{63}_{29}Cu_{34}$-41

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								E_γ: from (d,^{3}Heγ). B(M1)(W.u.)=0.013 *+5−4* if M1, B(E2)(W.u.)=1.5 *+6−4* if E2.
3897.45	(3/2$^+$,5/2$^+$)	3897.32[&]	100	0.0	3/2$^-$			
3902.1	(3/2$^+$,5/2$^+$)	3902.0[&]	100	0.0	3/2$^-$			
3932.3	(13/2$^-$)	1255.4 *5*	100	2677.17	11/2$^-$			E_γ: from (^{18}O,αp2nγ).
3960.1		3960.0[&]	100	0.0	3/2$^-$			
3978.47	(1/2,3/2,5/2$^-$)	1916.25[&]	38.9[&] *28*	2062.45	(3/2)$^-$			
		1967.16[&]	100[&] *8*	2012.274	3/2$^-$			
4017.08	1/2$^-$,3/2$^-$	4016.94[&]	100	0.0	3/2$^-$			
4039.1	(3/2$^-$)	2178[b] *2*	93 *19*	1861.34	7/2$^-$			
		2712[b] *3*	100 *26*	1326.014	7/2$^-$			
4054.84	1/2$^-$,3/2$^-$	3385.02[&]	65[&] *11*	669.724	1/2$^-$			
		4054.70[&]	100[&] *8*	0.0	3/2$^-$			
4110.5	1/2$^+$	4110.4 *7*	100 *33*	0.0	3/2$^-$	[E1]	1.73×10^{-3} *2*	α(K)=1.222×10^{-5} *17*; α(L)=1.190×10^{-6} *17*; α(M)=1.673×10^{-7} *23* α(N)=5.16×10^{-9} *7*; α(IPF)=0.001719 *24* B(E1)(W.u.)=2.9×10^{-4} *+10−9* E_γ: from (d,^{3}Heγ). Other: 4110 *4* from (n,n′γ).
4113.20	(1/2$^+$)	4113.06	100	0.0	3/2$^-$			
4119.1	(1/2$^+$)	4119.0	100	0.0	3/2$^-$			
4124.61	(1/2 to 7/2$^-$)	2113.30[&]	56[&] *11*	2012.274	3/2$^-$			
		2577.44[&]	94[&] *11*	1547.109	3/2$^-$			
		4124.47[&] *4*	100[&] *11*	0.0	3/2$^-$			E_γ: other: 4127 *4* from (n,n′γ).
4129.10	13/2$^+$	571.7 *5*		3556.8	(11/2$^-$)			E_γ: from (^{18}O,αp2nγ), weak.
		668.1 *2*	68 *7*	3461.17	11/2$^+$	(M1)	0.000519 *7*	α(K)=0.000466 *7*; α(L)=4.62×10^{-5} *6*; α(M)=6.50×10^{-6} *9* α(N)=1.988×10^{-7} *28* B(M1)(W.u.)=0.012 *+5−4* E_γ: weighted average of 668.0 *1* from (^{16}O,αpγ), 668.1 *3* from (^{18}O,αp2nγ), and 668.5 *2* from (α,pnγ). I_γ: from (^{18}O,αp2nγ). Mult.: D from $\gamma\gamma$(DCO) in (^{18}O,αp2nγ); $\Delta\pi$=no from level scheme.
		1451.8 *5*	20.5 *23*	2677.17	11/2$^-$	[E1]	0.000279 *4*	α(K)=5.34×10^{-5} *7*; α(L)=5.23×10^{-6} *7*; α(M)=7.35×10^{-7} *10* α(N)=2.256×10^{-8} *32*; α(IPF)=0.0002194 *31* B(E1)(W.u.)=6.6×10^{-6} *+30−25*

From ENSDF

$^{63}_{29}Cu_{34}$-42

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
4129.10	13/2$^+$	1623.9 *2*	100 *5*	2505.08	9/2$^+$	E2		0.0002310 *32*	B(E2)(W.u.)=0.78 *+35−28* α(K)=8.39×10^{-5} *12*; α(L)=8.25×10^{-6} *12*; α(M)=1.160×10^{-6} *16* α(N)=3.56×10^{-8} *5*; α(IPF)=0.0001376 *19* E_γ: weighted average of 1623.6 *3* from (^{18}O,αp2nγ) and 1624.0 *2* from (α,pnγ). E_γ,I_γ: from (^{18}O,αp2nγ). Mult.: Q from γγ(DCO) in (^{18}O,αp2nγ); M2 ruled out by RUL.
4132.78	(1/2$^-$ to 7/2$^-$)	3170.55[&]	100[&] *7*	962.145	5/2$^-$				
		4132.63[&]	60[&] *20*	0.0	3/2$^-$				
4145.1	(1/2$^-$ to 7/2$^-$)	3183.10[&]	98[&] *7*	962.145	5/2$^-$				
		4145.18[&]	100[&] *7*	0.0	3/2$^-$				E_γ: other: 4141 *4* from (n,n′γ).
4148.18	(1/2,3/2,5/2$^-$)	3478.35[&]	100	669.724	1/2$^-$				
4155.56	13/2$^+$	694.1 *1*	25.3 *11*	3461.17	11/2$^+$	M1+E2	−0.32 *+20−40*	0.00050 *5*	α(K)=0.00045 *5*; α(L)=4.4×10^{-5} *5*; α(M)=6.2×10^{-6} *7* α(N)=1.90×10^{-7} *19* B(M1)(W.u.)=0.0031 *+18−12*; B(E2)(W.u.)=1.1 *+34−10* E_γ: weighted average of 694.0 *1* from (^{16}O,αpγ), 694.1 *1* from (^{18}O,αp2nγ), and 694.3 *2* from (α,pnγ). I_γ: from (^{18}O,αp2nγ). Mult.,δ: D+Q and δ from γ(θ) in (α,pnγ); E1+M2 ruled out by RUL.
		861.0 *1*	13	3295.00	(11/2$^+$)	[M1,E2]		0.00034 *4*	α(K)=0.00031 *4*; α(L)=3.1×10^{-5} *4*; α(M)=4.3×10^{-6} *5* α(N)=1.31×10^{-7} *15* E_γ,I_γ: from (^{16}O,αpγ) only. B(M1)(W.u.)=9×10^{-4} *+6−3* if M1, B(E2)(W.u.)=2.1 *+15−7* if E2.
		1649.8 *1*	100 *4*	2505.08	9/2$^+$	E2		0.0002394 *34*	α(K)=8.13×10^{-5} *11*; α(L)=8.00×10^{-6} *11*; α(M)=1.125×10^{-6} *16* α(N)=3.45×10^{-8} *5*; α(IPF)=0.0001489 *21* B(E2)(W.u.)=0.63 *+42−19* E_γ: weighted average of 1650.0 *1* from (^{16}O,αpγ), 1649.7 *1* from (^{18}O,αp2nγ), and

From ENSDF

$^{63}_{29}Cu_{34}$-43

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								1649.8 *2* from (α,pnγ). Other: 1649.6 *6* fr (α,pγ). I_γ: from (^{18}O,αp2nγ). Mult.: Q from γγ(DCO) in (^{18}O,αp2nγ) and γ(θ) in (α,pnγ); M2 ruled out by RUL.
4155.56	13/2$^+$	1880.1 *5*	2.03 *23*	2274.7	(9/2$^-$)	(M2)	0.0002243 *31*	α(K)=0.0001080 *15*; α(L)=1.065×10^{-5} *15*; α(M)=1.499×10^{-6} *21* α(N)=4.61×10^{-8} *6*; α(IPF)=0.0001040 *15* B(M2)(W.u.)=0.35 *+23−11* Mult.: (Q) from γγ(DCO) in (^{18}O,αp2nγ); Δπ=yes from level scheme.
4183.5		4182 *4*	100	0.0	3/2$^-$			
4189		4189 *4*	100	0.0	3/2$^-$			
4225.59	5/2$^-$,7/2$^-$	2813.40[&]	34[&] *4*	1412.124	5/2$^-$	[M1,E2]	0.00069 *5*	α(K)=3.08×10^{-5} *6*; α(L)=3.01×10^{-6} *6*; α(M)=4.23×10^{-7} *9* α(N)=1.306×10^{-8} *26*; α(IPF)=0.00065 *5* B(M1)(W.u.)=0.011 *+6−4* if M1, B(E2)(W.u.)=2.3 *+13−8* if E2.
		3263.35 *18*	100 *4*	962.145	5/2$^-$	[M1,E2]	0.00087 *5*	α(K)=2.42×10^{-5} *5*; α(L)=2.37×10^{-6} *5*; α(M)=3.33×10^{-7} *7* α(N)=1.028×10^{-8} *20*; α(IPF)=0.00084 *5* E_γ: from (p,γ):E=res. Other: 3261.0 *18* from (d,^{3}Heγ). I_γ: from (d,^{3}Heγ). Other: 100 *6* from (p,γ):E=res. B(M1)(W.u.)=0.020 *+11−6* if M1, B(E2)(W.u.)=3.3 *+17−10* if E2.
		4225.44	24.0 *20*	0.0	3/2$^-$	[E2]	1.27×10^{-3} *2*	α(K)=1.654×10^{-5} *23*; α(L)=1.614×10^{-6} *23*; α(M)=2.270×10^{-7} *32* α(N)=7.01×10^{-9} *10*; α(IPF)=0.001249 *17* B(E2)(W.u.)=0.21 *+12−7* E_γ: from (p,γ):E=res. Other: 4221.3 *14* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. Other: 25 *4* from (d,^{3}Heγ).
4285.03	5/2$^-$,7/2$^-$	3322.79	100 *11*	962.145	5/2$^-$	[M1,E2]	0.00089 *5*	α(K)=2.36×10^{-5} *5*; α(L)=2.30×10^{-6} *5*; α(M)=3.24×10^{-7} *7* α(N)=9.99×10^{-9} *20*; α(IPF)=0.00087 *5* E_γ: from (p,γ):E=res. Others: 3324 *3* from (n,n′γ) and 3327.0 *34* from (d,^{3}Heγ). I_γ: from (d,^{3}Heγ). Other: 100 *40* from (n,n′γ). B(M1)(W.u.)=0.0122 *+31−26* if M1, B(E2)(W.u.)=1.90 *+48−41* if E2.
		4286.4 *10*	59 *11*	0.0	3/2$^-$	[M1,E2]	0.00123 *6*	α(K)=1.596×10^{-5} *32*; α(L)=1.557×10^{-6} *32*; α(M)=2.19×10^{-7} *4* α(N)=6.76×10^{-9} *14*; α(IPF)=0.00121 *6*

From ENSDF

$^{63}_{29}Cu_{34}$-44

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								E_γ: weighted average of 4282 *4* from (n,n′γ) and 4286.6 *9* from (d,^{3}Heγ). I_γ: weighted average of 52 *24* from (n,n′γ) and 61 *11* from (d,^{3}Heγ). B(M1)(W.u.)=0.0033 *+9−8* if M1, B(E2)(W.u.)=0.31 *+9−8* if E2.
4289.49	1/2$^-$,3/2$^-$	3327.25[&]	24[&] *3*	962.145	5/2$^-$			
		4289.33[&]	100[&] *5*	0.0	3/2$^-$			
4358.43	(1/2$^-$,3/2$^-$)	3396.19[&]	9.4[&] *16*	962.145	5/2$^-$			
		3688.59[&]	100[&] *5*	669.724	1/2$^-$			E_γ: other: 3692 *3* from (n,n′γ).
		4358.27[&]	20[&] *3*	0.0	3/2$^-$			E_γ: other: 4362 *4* from (n,n′γ). I_γ: other: I(4362γ)/I(3692γ)=100 *57*/57 *57* is discrepant.
4362.0	(1/2,3/2,5/2$^-$)	3692 *3*	57 *57*	669.724	1/2$^-$			
		4362 *4*	100 *57*	0.0	3/2$^-$			
4382.11	(1/2 to 7/2)	4381.95[&]	100	0.0	3/2$^-$			E_γ: other: 4381 *4* from (n,n′γ).
4403.97	(1/2$^-$,3/2,5/2$^-$)	3440.72[&]	94[&] *18*	962.145	5/2$^-$			
		3733.13[&]	100[&] *24*	669.724	1/2$^-$			
4413.8		3004 *3*	100	1412.124	5/2$^-$			
4419.70	(1/2 to 7/2$^-$)	2408.38[&]	51[&] *6*	2012.274	3/2$^-$			
		4419.53[&]	100[&] *14*	0.0	3/2$^-$			
4432.85	1/2$^+$	3764.7 *7*	100 *10*	669.724	1/2$^-$	[E1]	1.60×10^{-3} *2*	α(K)=1.364×10^{-5} *19*; α(L)=1.329×10^{-6} *19*; α(M)=1.868×10^{-7} *26* α(N)=5.76×10^{-9} *8*; α(IPF)=0.001584 *22* B(E1)(W.u.)=2.6×10^{-4} *+16−10* E_γ,I_γ: from (d,^{3}Heγ).
		4432.4 *3*	92 *10*	0.0	3/2$^-$	[E1]	1.85×10^{-3} *3*	α(K)=1.114×10^{-5} *16*; α(L)=1.085×10^{-6} *15*; α(M)=1.524×10^{-7} *21* α(N)=4.70×10^{-9} *7*; α(IPF)=0.001833 *26* B(E1)(W.u.)=1.5×10^{-4} *+9−6* E_γ,I_γ: from (d,^{3}Heγ). Other: 4429 *4* from (n,n′γ).
4457.02	(1/2,3/2,5/2$^-$)	2394.79[&]	61[&] *11*	2062.45	(3/2)$^-$			
		3787.17[&]	61[&] *11*	669.724	1/2$^-$			
		4456.85[&]	100[&] *17*	0.0	3/2$^-$			
4497.65	17/2$^+$	342.1 *1*	100 *4*	4155.56	13/2$^+$	E2	0.00639 *9*	B(E2)(W.u.)=1.734 *45* α(K)=0.00572 *8*; α(L)=0.000586 *8*; α(M)=8.20×10^{-5} *12* α(N)=2.372×10^{-6} *33* E_γ: weighted average of 342.0 *1* from (^{16}O,αpγ), 342.1 *1*

From ENSDF

$^{63}_{29}Cu_{34}$-45

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								from (^{18}O,αp2nγ), 340.9 *5* from (α,pγ), and 342.3 *2* from (α,pnγ). I_γ: from (^{18}O,αp2nγ), Mult.: from γ(θ) and γ(lin pol) in (α,pγ), γγ(DCO) in (^{18}O,αp2nγ).
4497.65	17/2$^+$	368.0 *1*	13.4 *7*	4129.10	13/2$^+$	[E2]	0.00497 *7*	α(K)=0.00445 *6*; α(L)=0.000454 *6*; α(M)=6.37×10^{-5} *9* α(N)=1.850×10^{-6} *26* B(E2)(W.u.)=0.161 *10* E_γ: from (^{16}O,αpγ). Other: 368.3 *3* from (^{18}O,αp2nγ). I_γ: from (^{18}O,αp2nγ).
4498.45	5/2$^-$	3828.60 *3*	100 *9*	669.724	1/2$^-$	[E2]	1.13×10^{-3} *2*	α(K)=1.919×10^{-5} *27*; α(L)=1.873×10^{-6} *26*; α(M)=2.63×10^{-7} *4* α(N)=8.13×10^{-9} *11*; α(IPF)=0.001111 *16* B(E2)(W.u.)=3.6 *+14−8* E_γ: other: 3827 *3* from (n,n′γ).
		4498.5 *7*	59 *17*	0.0	3/2$^-$	[M1,E2]	0.00130 *6*	α(K)=1.486×10^{-5} *30*; α(L)=1.450×10^{-6} *30*; α(M)=2.04×10^{-7} *4* α(N)=6.30×10^{-9} *13*; α(IPF)=0.00128 *6* E_γ: weighted average of 4496 *4* from (n,n′γ) and 4498.6 *7* from (d,^{3}Heγ). I_γ: from (p,γ):E=res. B(M1)(W.u.)=0.0112 *+42−32* if M1, B(E2)(W.u.)=0.96 *+36−27* if E2.
4501.43	(1/2 to 7/2)	4501.26[&]	100	0.0	3/2$^-$			
4505.52	(1/2 to 7/2)	3093.31[&]	100	1412.124	5/2$^-$			
4511.6	(5/2$^-$,7/2$^-$)	3549 *3*	100 *40*	962.145	5/2$^-$			
		4512 *4*	50 *30*	0.0	3/2$^-$			
4517.15	(1/2,3/2,5/2$^-$)	3847.30[&]	100[&] *13*	669.724	1/2$^-$			
		4516.98[&]	29[&] *10*	0.0	3/2$^-$			
4531.39	(1/2 to 7/2)	3569.14	100	962.145	5/2$^-$			
4533		4533 *4*		0.0	3/2$^-$			
4576.70	15/2$^+$	421.1 *1*	100 *5*	4155.56	13/2$^+$	(M1)	1.46×10^{-3} *2*	α(K)=0.001307 *18*; α(L)=0.0001304 *18*; α(M)=1.835×10^{-5} *26* α(N)=5.59×10^{-7} *8* B(M1)(W.u.)=0.09 *+7−4* E_γ: weighted average of 421.0 *1* from (^{16}O,αpγ), 421.2 *3* from (^{18}O,αp2nγ), and 421.3 *2* from (α,pnγ). I_γ: from (^{18}O,αp2nγ). Mult.: D from γγ(DCO) in (^{18}O,αp2nγ); Δπ=no from level scheme. Other: δ(Q/D)=−0.07 *+10−30* from γ(θ) in (α,pnγ).

From ENSDF

$^{63}_{29}Cu_{34}$-46

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
4576.70	15/2$^+$	447.1 *2*	36	4129.10	13/2$^+$	M1+E2	−0.4 *+2−5*	0.0015 *4*	α(K)=0.0013 *4*; α(L)=1.3×10^{-4} *4*; α(M)=1.8×10^{-5} *5* α(N)=5.5×10^{-7} *15* B(M1)(W.u.)=0.023 *+15−12*; B(E2)(W.u.)<104 E_γ,I_γ: from (α,pnγ). Other: 447.4 *5* from (^{18}O,αp2nγ). Mult.,δ: D+Q and δ from γ(θ) in (α,pnγ); E1+M2 ruled out by RUL.
4592.89	(1/2 to 7/2)	3630.63[&]	100	962.145	5/2$^-$				
4598		4598 *4*	100	0.0	3/2$^-$				
4613.4	(15/2$^-$)	875.9 *5*	100 *13*	3737.3	(13/2$^-$)				E_γ,I_γ: from (^{18}O,αp2nγ).
		1936.6 *5*	63 *13*	2677.17	11/2$^-$	(Q)			E_γ,I_γ: from (^{18}O,αp2nγ).
4640.0	(1/2 to 7/2)	4639.8[&]	100	0.0	3/2$^-$				E_γ: other: 4637 from (n,n′γ).
4643.75	(1/2 to 7/2)	3096.56[&]	100[&] *11*	1547.109	3/2$^-$				
		4643.57[&]	67[&] *5*	0.0	3/2$^-$				
4646.70	(1/2 to 7/2)	4646.52[&]	100	0.0	3/2$^-$				
4752.66		3205.46[&]	100	1547.109	3/2$^-$				
4789.14	(1/2 to 7/2)	4788.95[&]	100	0.0	3/2$^-$				
4795.77	(1/2$^+$)	3833.50[&]	100	962.145	5/2$^-$				
4806.23	(1/2$^+$)	4136.36	100	669.724	1/2$^-$	[E1]		1.74×10^{-3} *2*	α(K)=1.213×10^{-5} *17*; α(L)=1.181×10^{-6} *17*; α(M)=1.660×10^{-7} *23* α(N)=5.12×10^{-9} *7*; α(IPF)=0.001728 *24* B(E1)(W.u.)=9×10^{-4} *+10−4*
		4804.9 *25*		0.0	3/2$^-$	[E1]		1.96×10^{-3} *3*	α(K)=1.010×10^{-5} *14*; α(L)=9.83×10^{-7} *14*; α(M)=1.382×10^{-7} *19* α(N)=4.26×10^{-9} *6*; α(IPF)=0.001953 *27* E_γ: from (d,^{3}Heγ). Other: 4804 *4* from (n,n′γ).
4810.20	(1/2 to 7/2)	4810.00[&]	100	0.0	3/2$^-$				
4838.50		4838.30[&]	100	0.0	3/2$^-$				
4869.85	(1/2 to 7/2)	3457.62[&] *3*	66[&] *6*	1412.124	5/2$^-$				E_γ: other: 3458 *3* from (n,n′γ).
		3907.58[&] *3*	100[&] *8*	962.145	5/2$^-$				E_γ: other: 3907 *3* from (n,n′γ).
4919.0	(13/2$^+$ to 19/2$^+$)	421.4 *5*	100	4497.65	17/2$^+$				E_γ: from (α,pγ).
4955.40	5/2$^-$,7/2$^-$	2874.01[&]	100[&] *10*	2081.32	5/2$^-$				
		2944.05[&]	86[&] *10*	2012.274	3/2$^-$				
		4955.19[&]	35[&] *7*	0.0	3/2$^-$				

From ENSDF

$^{63}_{29}Cu_{34}$-47

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
5007.11	$(19/2^+)$	510.0 *1*	100	4497.65	$17/2^+$				E_γ: from (^{16}O,αpγ).
5016.45	(1/2 to 7/2)	4054.17[&]	100	962.145	$5/2^-$				
5053.0	(1/2 to 7/2)	5052.8[&]	100	0.0	$3/2^-$				
5073.47	(1/2 to 7/2)	5073.25[&]	100	0.0	$3/2^-$				
5101.18	(1/2 to 7/2)	5100.96[&]	100	0.0	$3/2^-$				
5139.6	(1/2 to 7/2)	5139.4[&]	100	0.0	$3/2^-$				E_γ: other: 5135 *4* from (n,n′γ).
5161.19	$(1/2 \text{ to } 7/2)^-$	5160.96[&]	100	0.0	$3/2^-$				
5225.5	(1/2 to 7/2)	5225.3[&]	100	0.0	$3/2^-$				
5253		5253 *4*		0.0	$3/2^-$				
5273.75	(1/2 to 7/2)	5273.51[&]	100	0.0	$3/2^-$				
5292		5292 *4*		0.0	$3/2^-$				
5304.3	$(3/2^-,5/2,7/2^-)$	3977 *3*		1326.014	$7/2^-$				
		5304 *4*		0.0	$3/2^-$				
5311.95	(1/2 to 7/2)	5311.71[&]	100	0.0	$3/2^-$				
5318.12		821.0 *1*	100	4497.65	$17/2^+$				E_γ: from (^{16}O,αpγ).
5335.3	$(1/2^+)$	3323.9[&]	100	2012.274	$3/2^-$				
5358.6	$(19/2)^+$	860.6 *1*	100	4497.65	$17/2^+$	M1+E2	−0.32 *+20−40*	0.000311 *21*	α(K)=0.000280 *19*; α(L)=2.77×10^{-5} *19*; α(M)=3.89×10^{-6} *27* α(N)=1.19×10^{-7} *8* B(M1)(W.u.)=0.039 *+7−15*; B(E2)(W.u.)=9 *+22−8* E_γ: from (^{18}O,αp2nγ). Other: 860.8 *2* from (α,pnγ). Mult.,δ: D+Q and δ from $\gamma(\theta)$ in (α,pnγ) and $\gamma\gamma$(DCO) in (^{18}O,αpnγ); E1+M2 ruled out by RUL.
5366.07	(1/2 to 7/2)	5365.83[&]	100	0.0	$3/2^-$				E_γ: other: 5362 *4* from (n,n′γ).
5401.8		3854 *3*		1547.109	$3/2^-$				
		3990 *3*		1412.124	$5/2^-$				
5413.1	$(17/2^+)$	836.1 *3*	100	4576.70	$15/2^+$	(M1+E2)	−0.25 *+10−30*		E_γ: weighted average of 835.7 *3* from (^{18}O,αp2nγ) and 836.3 *2* from (α,pnγ). Mult.,δ: D+Q from $\gamma(\theta)$ in (α,pnγ); M1+E2 is more likely.
5542.7		4580.4[&]	100	962.145	$5/2^-$				
5566		4604 *4*		962.145	$5/2^-$				
5571.36	(1/2 to 7/2)	4159.09[&]	100	1412.124	$5/2^-$				
5579.30	(1/2 to 7/2)	5579.04[&]	100	0.0	$3/2^-$				
5591.62	(1/2 to 7/2)	5591.35[&]	100	0.0	$3/2^-$				
5602.0	(1/2 to 7/2)	4932.1[&]	100	669.724	$1/2^-$				

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$^{63}_{29}Cu_{34}$-48

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
5734.8	(1/2 to 7/2)	5734.5[&]	100	0.0	3/2$^-$			
5768.13	(21/2$^+$)	1271.0 *1*	100	4497.65	17/2$^+$	Q		E_γ: from (^{16}O,αpγ). Other: 1270.6 *3* from (^{18}O,αp2nγ).
5797.32		5797.03[&]	100	0.0	3/2$^-$			
5803.87	(1/2 to 7/2)	5803.58[&]	100	0.0	3/2$^-$			
5828.33	(1/2 to 7/2)	5828.04[&]	100	0.0	3/2$^-$			
5835	(5/2$^-$,7/2$^-$)	4290 *4*		1547.109	3/2$^-$			
		5163 *4*		669.724	1/2$^-$			
6092.78		6092.46[&]	100	0.0	3/2$^-$			
6283.14	(19/2$^+$)	871.7 *3*	22.2 *9*	5413.1	(17/2$^+$)			E_γ,I_γ: from (^{18}O,αp2nγ).
		925.8 *5*	6.8 *9*	5358.6	(19/2)$^+$			E_γ,I_γ: from (^{18}O,αp2nγ).
		1707.0 *1*	13	4576.70	15/2$^+$			E_γ,I_γ: from (^{16}O,αpγ).
		1786.6 *3*	100 *4*	4497.65	17/2$^+$	D		E_γ: unweighted average of 1786.0 *1* from (^{16}O,αpγ), 1786.8 *1* from (^{18}O,αp2nγ), and 1787.0 *2* from (α,pnγ). I_γ: from (^{18}O,αp2nγ).
6374.86		6374.51[&]	100	0.0	3/2$^-$			
6495.5	(23/2)$^+$	726.4 *5*	14.7 *30*	5768.13	(21/2$^+$)			E_γ,I_γ: from (^{18}O,αp2nγ).
		1136.5 *3*	100 *6*	5358.6	(19/2)$^+$			E_γ,I_γ: from (^{18}O,αp2nγ).
6749.4		2252.6 *5*		4497.65	17/2$^+$			
7073.71	(23/2$^+$)	789.7 *3*	100 *4*	6283.14	(19/2$^+$)	E2	0.000483 *7*	α(K)=0.000434 *6*; α(L)=4.32×10^{-5} *6*; α(M)=6.07×10^{-6} *9* α(N)=1.832×10^{-7} *26* E_γ: unweighted average of 790.0 *1* from (^{16}O,αpγ) and 789.4 *3* from (^{18}O,αp2nγ). I_γ: from (^{18}O,αp2nγ).
		1715.3 *5*	7.5 *11*	5358.6	(19/2)$^+$			E_γ,I_γ: from (^{18}O,αp2nγ).
7282.7	(1/2 to 7/2)	1478.8	1.5	5803.87	(1/2 to 7/2)			
		1916.6	1.5	5366.07	(1/2 to 7/2)			
		1947.4	0.49	5335.3	(1/2$^+$)			
		2121.5	1.2	5161.19	(1/2 to 7/2)$^-$			
		2181.5	2.4	5101.18	(1/2 to 7/2)			
		2209.2	0.49	5073.47	(1/2 to 7/2)			
		2327.3	0.24	4955.40	5/2$^-$,7/2$^-$			
		2412.8	0.98	4869.85	(1/2 to 7/2)			
		2486.9	1.2	4795.77	(1/2$^+$)			
		2530.0	0.73	4752.66				
		2638.9	0.49	4643.75	(1/2 to 7/2)			
		2784.2	2.0	4498.45	5/2$^-$			
		2825.6	0.49	4457.02	(1/2,3/2,5/2$^-$)			
		2862.9	0.24	4419.70	(1/2 to 7/2$^-$)			
		2879.7	2.4	4403.97	(1/2$^-$,3/2,5/2$^-$)			

From ENSDF

$^{63}_{29}Cu_{34}$-49

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π
7282.7	(1/2 to 7/2)	2924.2	1.5	4358.43	$(1/2^-,3/2^-)$
		2927.9	0.73	4354.75	$(1/2^-,3/2^-)$
		2997.6	0.98	4285.03	$5/2^-,7/2^-$
		3057.0	0.73	4225.59	$5/2^-,7/2^-$
		3137.3	0.49	4145.1	$(1/2^-$ to $7/2^-)$
		3149.8	0.73	4132.78	$(1/2^-$ to $7/2^-)$
		3158.0	0.49	4124.61	$(1/2$ to $7/2^-)$
		3169.4	2.4	4113.20	$(1/2^+)$
		3227.8	5.4	4054.84	$1/2^-,3/2^-$
		3265.5	3.7	4017.08	$1/2^-,3/2^-$
		3304.1	1.2	3978.47	$(1/2,3/2,5/2^-)$
		3385.2	0.73	3897.45	$(3/2^+,5/2^+)$
		3497.1	0.73	3785.53	$1/2^-,3/2^-$
		3508.2	1.7	3774.43	$(1/2,3/2,5/2^-)$
		3563.6	2.7	3719.04	$(1/2,3/2)^+$
		3635.1	2.4	3647.51	$(1/2,3/2,5/2^-)$
		3701.9	2.7	3580.71	$1/2^-,3/2^-$
		3713.1	1.2	3569.47	
		3741.3	0.49	3541.3	$(1/2^-$ to $7/2)$
		3808.0	0.98	3474.59	$5/2^+$
		3817.6	3.7	3465.00	$1/2^-,3/2^-$
		3852.8	3.2	3429.80	$(3/2)^-$
		3864.4	0.49	3418.16	(1/2 to 7/2)
		3878.2	2.0	3404.41	(1/2 to 7/2)
		3975.5	0.49	3307.03	$(3/2^+)$
		3984.9	2.0	3297.62	$3/2^-$
		4182.0	3.7	3100.54	$1/2^-,3/2^-$
		4238.0	7.8	3044.52	$(5/2)^-$
		4305.6	2.0	2976.94	$1/2^-,3/2^-,5/2^-$
		4393.3	2.2	2889.29	$(1/2^-,3/2,5/2^-)$
		4425.3	4.9	2857.55	$(1/2^-,3/2^-)$
		4502.2	2.2	2780.36	$(3/2^-)$
		4585.8	15	2696.69	$1/2^-,3/2^-,5/2^-$
		4772.0	0.49	2511.903	$(3/2)^+$
		4785.2	7.8	2497.26	(3/2)
		5201.2	1.2	2081.32	$5/2^-$
		5220.3	3.9	2062.45	$(3/2)^-$
		5271.2	2.2	2012.274	$3/2^-$
		5735.3	16	1547.109	$3/2^-$
		5870.3	7.1	1412.124	$5/2^-$
		6320.2	1.7	962.145	$5/2^-$
		6612.6	100	669.724	$1/2^-$
7282.7	(1/2 to 7/2)	7282.3	6.1	0.0	$3/2^-$
7363.94	(1/2 to 7/2)	989.07	1.5	6374.86	
		1271.15	3	6092.78	
		1496.29	2.5	5867.63	(1/2 to 7/2)
		1560.05	1	5803.87	(1/2 to 7/2)
		1566.60	2	5797.32	
		1792.55	3	5571.36	(1/2 to 7/2)
		2202.71	2	5161.19	$(1/2$ to $7/2)^-$
		2262.72	9.5	5101.18	(1/2 to 7/2)
		2290.43	0.5	5073.47	(1/2 to 7/2)
		2408.49	2	4955.40	$5/2^-,7/2^-$
		2525.39	1	4838.50	
		2557.65	0.5	4806.23	$(1/2^+)$
		2568.11	3	4795.77	$(1/2^+)$
		2611.22	4.5	4752.66	
		2672.08	5	4691.80	(1/2 to 7/2)
		2717.18	3.5	4646.70	(1/2 to 7/2)
		2720.13	2.5	4643.75	(1/2 to 7/2)
		2770.99	0.5	4592.89	(1/2 to 7/2)
		2832.48	3.5	4531.39	(1/2 to 7/2)
		2858.35	4.5	4505.52	(1/2 to 7/2)
		2862.44	2	4501.43	(1/2 to 7/2)
		2865.42	4.5	4498.45	$5/2^-$
		2893.09	1.5	4470.78	(1/2 to 7/2)
		2906.85	2.5	4457.02	$(1/2,3/2,5/2^-)$
		2960.90	3.5	4403.97	$(1/2^-,3/2,5/2^-)$
		3005.43	5.5	4358.43	$(1/2^-,3/2^-)$
		3074.37	1	4289.49	$1/2^-,3/2^-$
		3138.27	11	4225.59	$5/2^-,7/2^-$
		3215.67	4.5	4148.18	$(1/2,3/2,5/2^-)$
		3346.77	12	4017.08	$1/2^-,3/2^-$
		3385.37	5	3978.47	$(1/2,3/2,5/2^-)$
		3466.39	26	3897.45	$(3/2^+,5/2^+)$
		3589.40	0.5	3774.43	$(1/2,3/2,5/2^-)$
		3623.64	14	3740.19	$(3/2,5/2)^+$
		3716.31	50	3647.51	$(1/2,3/2,5/2^-)$
		3783.11	6.5	3580.71	$1/2^-,3/2^-$
		3794.35	6.5	3569.47	
		3889.22	1	3474.59	$5/2^+$
		3945.65	1.5	3418.16	(1/2 to 7/2)
		3959.40	20	3404.41	(1/2 to 7/2)
		4056.77	7.5	3307.03	$(3/2^+)$

From ENSDF

$^{63}_{29}Cu_{34}$-50

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f
7363.94	(1/2 to 7/2)	4066.18	0.5	3297.62	$3/2^-$
		4319.26	5.5	3044.52	$(5/2)^-$
		4386.84	19	2976.94	$1/2^-,3/2^-,5/2^-$
		4583.40	2	2780.36	$(3/2^-)$
		4667.06	1	2696.69	$1/2^-,3/2^-,5/2^-$
		4852.74	15	2511.903	$(3/2)^+$
		4866.48	19	2497.26	(3/2)
		5301.52	100	2062.45	$(3/2)^-$
		5352.42	21	2012.274	$3/2^-$
		5816.54	36	1547.109	$3/2^-$
		6693.83	44	669.724	$1/2^-$
		7363.48	1	0.0	$3/2^-$
7400.3	1/2	1595.99	0.21	5803.87	(1/2 to 7/2)
		1665.1	0.43	5734.8	(1/2 to 7/2)
		2126.09	0.21	5273.75	(1/2 to 7/2)
		2326.36	0.21	5073.47	(1/2 to 7/2)
		2346.8	0.43	5053.0	(1/2 to 7/2)
		2444.43	0.64	4955.40	$5/2^-,7/2^-$
		2529.98	0.21	4869.85	(1/2 to 7/2)
		2589.62	0.64	4810.20	(1/2 to 7/2)
		2593.59	0.21	4806.23	$(1/2^+)$
		2604.05	0.64	4795.77	$(1/2^+)$
		2610.68	0.21	4789.14	(1/2 to 7/2)
		2708.02	0.43	4691.80	(1/2 to 7/2)
		2756.07	1.1	4643.75	(1/2 to 7/2)
		2806.92	0.85	4592.89	(1/2 to 7/2)
		2868.42	0.64	4531.39	(1/2 to 7/2)
		2894.29	0.85	4505.52	(1/2 to 7/2)
		2929.03	0.43	4470.78	(1/2 to 7/2)
		2980.10	0.43	4419.70	$(1/2\ to\ 7/2^-)$
		2996.83	0.21	4403.97	$(1/2^-,3/2,5/2^-)$
		3017.69	0.85	4382.11	(1/2 to 7/2)
		3110.31	0.43	4289.49	$1/2^-,3/2^-$
		3114.77	1.1	4285.03	$5/2^-,7/2^-$
		3174.20	0.21	4225.59	$5/2^-,7/2^-$
		3254.46	2.6	4145.1	$(1/2^-\ to\ 7/2^-)$
		3275.18	0.21	4124.61	$(1/2\ to\ 7/2^-)$
		3344.95	0.43	4054.84	$1/2^-,3/2^-$
		3382.70	0.64	4017.08	$1/2^-,3/2^-$
		3502.33	2.1	3897.45	$(3/2^+,5/2^+)$
		3514.10	0.43	3885.68	$(5/2^+)$
		3625.34	0.21	3774.43	$(1/2,3/2,5/2^-)$
7400.3	1/2	3659.58	0.21	3740.19	$(3/2,5/2)^+$
		3680.73	0.64	3719.04	$(1/2,3/2)^+$
		3752.25	0.21	3647.51	$(1/2,3/2,5/2^-)$
		3819.05	0.64	3580.71	$1/2^-,3/2^-$
		3830.29	1.5	3569.47	
		3858.5	0.64	3541.3	$(1/2^-\ to\ 7/2)$
		3925.16	0.21	3474.59	$5/2^+$
		3934.75	0.21	3465.00	$1/2^-,3/2^-$
		3969.95	0.85	3429.80	$(3/2)^-$
		3995.33	2.3	3404.41	(1/2 to 7/2)
		4092.71	0.21	3307.03	$(3/2^+)$
		4102.12	0.21	3297.62	$3/2^-$
		4355.20	0.64	3044.52	$(5/2)^-$
		4510.42	0.85	2889.29	$(1/2^-,3/2,5/2^-)$
		4542.43	1.3	2857.55	$(1/2^-,3/2^-)$
		4619.34	0.21	2780.36	$(3/2^-)$
		4682.8	0.21	2717.04	$3/2^-,5/2^-$
		4703.00	2.6	2696.69	$1/2^-,3/2^-,5/2^-$
		4718.1	0.43	2682.45	$(1/2^-,3/2^-)$
		4863.48	2.1	2535.83	$5/2^-$
		4890.68	3.2	2511.903	$(3/2)^+$
		4902.42	0.21	2497.26	(3/2)
		5063.11	0.21	2336.48	$5/2^-$
		5337.45	0.43	2062.45	$(3/2)^-$
		5388.36	6.6	2012.274	$3/2^-$
		5852.48	8.9	1547.109	$3/2^-$
		5987.45	3.4	1412.124	$5/2^-$
		6437.38	0.43	962.145	$5/2^-$
		6729.77	53	669.724	$1/2^-$
		7399.41	100	0.0	$3/2^-$
7475.27	1/2	1671.38	1.2	5803.87	(1/2 to 7/2)
		1883.62	1.2	5591.62	(1/2 to 7/2)
		1895.94	7.7	5579.30	(1/2 to 7/2)
		2109.16	1.2	5366.07	(1/2 to 7/2)
		2139.9	1.5	5335.3	$(1/2^+)$
		2163.28	1.2	5311.95	(1/2 to 7/2)
		2201.48	2.4	5273.75	(1/2 to 7/2)
		2314.03	1.2	5161.19	$(1/2\ to\ 7/2)^-$
		2401.75	2.1	5073.47	(1/2 to 7/2)
		2458.77	0.88	5016.45	(1/2 to 7/2)
		2605.36	2.7	4869.85	(1/2 to 7/2)
		2668.98	5.9	4806.23	$(1/2^+)$

$^{63}_{29}Cu_{34}$-51

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Comments
7475.27	1/2	2686.07	0.88	4789.14	(1/2 to 7/2)	
		2831.45	5	4643.75	(1/2 to 7/2)	
		2835.2	0.88	4640.0	(1/2 to 7/2)	
		2882.31	3.8	4592.89	(1/2 to 7/2)	
		2943.81	2.7	4531.39	(1/2 to 7/2)	
		2958.05	1.8	4517.15	(1/2,3/2,5/2$^-$)	
		2973.77	1.8	4501.43	(1/2 to 7/2)	
		3004.41	1.5	4470.78	(1/2 to 7/2)	
		3018.17	2.7	4457.02	(1/2,3/2,5/2$^-$)	
		3072.22	1.8	4403.97	(1/2$^-$,3/2,5/2$^-$)	
		3120.44	1.2	4354.75	(1/2$^-$,3/2$^-$)	
		3185.69	2.1	4289.49	1/2$^-$,3/2$^-$	
		3249.59	1.5	4225.59	5/2$^-$,7/2$^-$	
		3329.85	5	4145.1	(1/2$^-$ to 7/2$^-$)	
		3350.56	0.59	4124.61	(1/2 to 7/2$^-$)	
		3361.97	0.59	4113.20	(1/2$^+$)	
		3420.33	0.59	4054.84	1/2$^-$,3/2$^-$	
		3496.70	0.88	3978.47	(1/2,3/2,5/2$^-$)	
		3577.71	2.9	3897.45	(3/2$^+$,5/2$^+$)	
		3589.48	0.88	3885.68	(5/2$^+$)	
		3689.62	11	3785.53	1/2$^-$,3/2$^-$	
		3700.72	0.59	3774.43	(1/2,3/2,5/2$^-$)	
		3756.11	0.59	3719.04	(1/2,3/2)$^+$	
		3827.64	5.9	3647.51	(1/2,3/2,5/2$^-$)	
		3905.67	1.5	3569.47		
		4000.54	2.1	3474.59	5/2$^+$	
		4045.33	2.9	3429.80	(3/2)$^-$	
		4168.09	9.1	3307.03	(3/2$^+$)	
		4374.57	13	3100.54	1/2$^-$,3/2$^-$	
		4588.0	5.3	2889.29	(1/2$^-$,3/2,5/2$^-$)	
		4694.72	6.5	2780.36	(3/2$^-$)	
		4793.5	2.4	2682.45	(1/2$^-$,3/2$^-$)	
		4964.06	5.9	2511.903	(3/2)$^+$	
		4977.80	19	2497.26	(3/2)	
		5412.83	1.2	2062.45	(3/2)$^-$	
		5463.74	0.88	2012.274	3/2$^-$	
		5927.86	35	1547.109	3/2$^-$	
		6805.15	3.2	669.724	1/2$^-$	
		7474.79	100	0.0	3/2$^-$	
7479.2		2121.8 *5*		5358.6	(19/2)$^+$	E_γ: from (^{18}O,αp2nγ).
7513.2	(3/2)	4412.5	19	3100.54	1/2$^-$,3/2$^-$	
		4623.7	7	2889.29	(1/2$^-$,3/2,5/2$^-$)	

From ENSDF

$^{63}_{29}Cu_{34}$-52

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
7513.2	(3/2)	4732.7	16	2780.36	(3/2$^-$)		
		5015.7	14	2497.26	(3/2)		
		5965.8	47	1547.109	3/2$^-$		
		6100.8	9.3	1412.124	5/2$^-$		
		6550.7	4.7	962.145	5/2$^-$		
		6843.1	100	669.724	1/2$^-$	D+Q	δ: −5 *2* or +0.3 *1* from (p,γ):E=res.
		7512.7	16	0.0	3/2$^-$		
7532.20	1/2	1728.31	0.79	5803.87	(1/2 to 7/2)		
		1940.55	0.79	5591.62	(1/2 to 7/2)		
		2258.41	0.53	5273.75	(1/2 to 7/2)		
		2306.7	2.1	5225.5	(1/2 to 7/2)		
		2370.96	0.53	5161.19	(1/2 to 7/2)$^-$		
		2392.6	1.3	5139.6	(1/2 to 7/2)		
		2662.29	0.79	4869.85	(1/2 to 7/2)		
		2725.91	0.53	4806.23	(1/2$^+$)		
		2743.00	0.79	4789.14	(1/2 to 7/2)		
		2885.43	1.3	4646.70	(1/2 to 7/2)		
		2939.24	0.26	4592.89	(1/2 to 7/2)		
		3000.73	0.53	4531.39	(1/2 to 7/2)		
		3014.97	2.1	4517.15	(1/2,3/2,5/2$^-$)		
		3030.69	0.53	4501.43	(1/2 to 7/2)		
		3033.67	1.6	4498.45	5/2$^-$		
		3075.10	2.4	4457.02	(1/2,3/2,5/2$^-$)		
		3129.15	1.1	4403.97	(1/2$^-$,3/2,5/2$^-$)		
		3150.01	0.26	4382.11	(1/2 to 7/2)		
		3173.68	2.1	4358.43	(1/2$^-$,3/2$^-$)		
		3177.36	0.53	4354.75	(1/2$^-$,3/2$^-$)		
		3242.62	5.5	4289.49	1/2$^-$,3/2$^-$		
		3247.08	1.1	4285.03	5/2$^-$,7/2$^-$		
		3306.52	1.8	4225.59	5/2$^-$,7/2$^-$		
		3386.77	1.3	4145.1	(1/2$^-$ to 7/2$^-$)		
		3399.32	0.26	4132.78	(1/2$^-$ to 7/2$^-$)		
		3515.02	1.8	4017.08	1/2$^-$,3/2$^-$		
		3634.64	1.1	3897.45	(3/2$^+$,5/2$^+$)		
		3646.41	1.1	3885.68	(5/2$^+$)		
		3665.54	0.53	3866.55	(1/2$^-$ to 7/2)		
		3746.55	0.26	3785.53	1/2$^-$,3/2$^-$		
		3757.65	2.6	3774.43	(1/2,3/2,5/2$^-$)		
		3791.89	0.79	3740.19	(3/2,5/2)$^+$		
		3813.04	1.6	3719.04	(1/2,3/2)$^+$		
		3884.56	3.2	3647.51	(1/2,3/2,5/2$^-$)		
		3951.36	0.53	3580.71	1/2$^-$,3/2$^-$		

From ENSDF

$^{63}_{29}Cu_{34}$-53

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π
7532.20	1/2	3962.60	1.1	3569.47	
		3990.8	1.1	3541.3	(1/2$^-$ to 7/2)
		4057.47	1.6	3474.59	5/2$^+$
		4067.06	1.8	3465.00	1/2$^-$,3/2$^-$
		4102.26	0.53	3429.80	(3/2)$^-$
		4113.90	2.9	3418.16	(1/2 to 7/2)
		4127.65	0.53	3404.41	(1/2 to 7/2)
		4225.02	1.6	3307.03	(3/2$^+$)
		4234.43	2.6	3297.62	3/2$^-$
		4431.49	1.8	3100.54	1/2$^-$,3/2$^-$
		4487.51	0.26	3044.52	(5/2)$^-$
		4555.08	1.1	2976.94	1/2$^-$,3/2$^-$,5/2$^-$
		4644.9	2.6	2889.29	(1/2$^-$,3/2,5/2$^-$)
		4674.74	1.1	2857.55	(1/2$^-$,3/2$^-$)
		4725.4	1.3	2808.14	3/2$^-$
		4751.65	7.4	2780.36	(3/2$^-$)
		4815.1	0.53	2717.04	3/2$^-$,5/2$^-$
		4850.4	1.3	2682.45	(1/2$^-$,3/2$^-$)
		5020.99	0.53	2511.903	(3/2)$^+$
		5034.72	19	2497.26	(3/2)
		5127.3	0.53	2404.77	7/2$^-$
		5195.42	0.26	2336.48	5/2$^-$
		5450.63	1.8	2081.32	5/2$^-$
		5469.76	11	2062.45	(3/2)$^-$
		5984.79	13	1547.109	3/2$^-$
		6119.76	2.6	1412.124	5/2$^-$
		6204.86	7.9	1326.014	7/2$^-$
		6569.69	26	962.145	5/2$^-$
		6862.08	100	669.724	1/2$^-$
		7531.72	4.7	0.0	3/2$^-$
7607.80	(1/2)	1740.14	0.86	5867.63	(1/2 to 7/2)
		1779.44	0.29	5828.33	(1/2 to 7/2)
		1803.90	0.29	5803.87	(1/2 to 7/2)
		2036.41	0.86	5571.36	(1/2 to 7/2)
		2446.56	2.0	5161.19	(1/2 to 7/2)$^-$
		2506.57	1.1	5101.18	(1/2 to 7/2)
		2554.7	0.86	5053.0	(1/2 to 7/2)
		2591.29	0.86	5016.45	(1/2 to 7/2)
		2652.34	1.1	4955.40	5/2$^-$,7/2$^-$
		2731.09	0.29	4876.65	(1/2 to 7/2)
		2737.89	0.86	4869.85	(1/2 to 7/2)
		2961.03	0.86	4646.70	(1/2 to 7/2)
7607.80	(1/2)	2967.7	0.29	4640.0	(1/2 to 7/2)
		3014.83	0.86	4592.89	(1/2 to 7/2)
		3076.33	0.29	4531.39	(1/2 to 7/2)
		3102.20	3.1	4505.52	(1/2 to 7/2)
		3106.29	1.1	4501.43	(1/2 to 7/2)
		3136.94	0.86	4470.78	(1/2 to 7/2)
		3150.70	1.4	4457.02	(1/2,3/2,5/2$^-$)
		3188.01	0.86	4419.70	(1/2 to 7/2$^-$)
		3204.74	0.29	4403.97	(1/2$^-$,3/2,5/2$^-$)
		3249.28	0.86	4358.43	(1/2$^-$,3/2$^-$)
		3252.96	0.29	4354.75	(1/2$^-$,3/2$^-$)
		3318.22	0.29	4289.49	1/2$^-$,3/2$^-$
		3322.68	1.1	4285.03	5/2$^-$,7/2$^-$
		3474.92	0.57	4132.78	(1/2$^-$ to 7/2$^-$)
		3710.23	0.86	3897.45	(3/2$^+$,5/2$^+$)
		3722.00	0.29	3885.68	(5/2$^+$)
		3833.25	2.6	3774.43	(1/2,3/2,5/2$^-$)
		3867.48	1.4	3740.19	(3/2,5/2)$^+$
		3888.63	4.3	3719.04	(1/2,3/2)$^+$
		3960.16	0.57	3647.51	(1/2,3/2,5/2$^-$)
		4026.95	0.29	3580.71	1/2$^-$,3/2$^-$
		4142.65	1.4	3465.00	1/2$^-$,3/2$^-$
		4189.49	2.3	3418.16	(1/2 to 7/2)
		4310.02	1.4	3297.62	3/2$^-$
		4507.09	1.4	3100.54	1/2$^-$,3/2$^-$
		4563.10	5.7	3044.52	(5/2)$^-$
		4630.68	1.7	2976.94	1/2$^-$,3/2$^-$,5/2$^-$
		4750.34	0.57	2857.55	(1/2$^-$,3/2$^-$)
		4827.24	0.29	2780.36	(3/2$^-$)
		4910.91	6.3	2696.69	1/2$^-$,3/2$^-$,5/2$^-$
		4926.0	1.1	2682.45	(1/2$^-$,3/2$^-$)
		5096.58	2.6	2511.903	(3/2)$^+$
		5110.32	13	2497.26	(3/2)
		5545.35	2.9	2062.45	(3/2)$^-$
		6060.38	17	1547.109	3/2$^-$
		6937.67	100	669.724	1/2$^-$
		7607.31	94	0.0	3/2$^-$
7712.2	(1/2 to 7/2)	1908.3	0.19	5803.87	(1/2 to 7/2)
		2120.5	0.58	5591.62	(1/2 to 7/2)
		2169.5	0.19	5542.7	
		2400.2	0.19	5311.95	(1/2 to 7/2)
		2438.4	0.58	5273.75	(1/2 to 7/2)

From ENSDF

$^{63}_{29}Cu_{34}$-54

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π
7712.2	(1/2 to 7/2)	2551.0	0.96	5161.19	(1/2 to 7/2)$^-$
		2572.5	0.77	5139.6	(1/2 to 7/2)
		2638.7	0.96	5073.47	(1/2 to 7/2)
		2659.1	0.39	5053.0	(1/2 to 7/2)
		2756.7	1.4	4955.40	$5/2^-,7/2^-$
		2835.5	0.58	4876.65	(1/2 to 7/2)
		2842.3	0.39	4869.85	(1/2 to 7/2)
		2905.9	1.4	4806.23	$(1/2^+)$
		2916.4	0.77	4795.77	$(1/2^+)$
		2923.0	0.58	4789.14	(1/2 to 7/2)
		3020.3	0.39	4691.80	(1/2 to 7/2)
		3065.4	0.58	4646.70	(1/2 to 7/2)
		3072.1	0.39	4640.0	(1/2 to 7/2)
		3210.7	0.19	4501.43	(1/2 to 7/2)
		3241.3	0.96	4470.78	(1/2 to 7/2)
		3255.1	0.39	4457.02	$(1/2,3/2,5/2^-)$
		3309.1	0.19	4403.97	$(1/2^-,3/2,5/2^-)$
		3353.7	1.2	4358.43	$(1/2^-,3/2^-)$
		3486.5	0.39	4225.59	$5/2^-,7/2^-$
		3563.9	0.58	4148.18	$(1/2,3/2,5/2^-)$
		3566.8	0.77	4145.1	$(1/2^-$ to $7/2^-)$
		3579.3	0.39	4132.78	$(1/2^-$ to $7/2^-)$
		3587.5	4.2	4124.61	(1/2 to $7/2^-$)
		3598.9	1.2	4113.20	$(1/2^+)$
		3657.3	0.77	4054.84	$1/2^-,3/2^-$
		3695.0	0.19	4017.08	$1/2^-,3/2^-$
		3733.6	0.39	3978.47	$(1/2,3/2,5/2^-)$
		3814.6	1.5	3897.45	$(3/2^+,5/2^+)$
		3926.5	0.58	3785.53	$1/2^-,3/2^-$
		3937.6	0.19	3774.43	$(1/2,3/2,5/2^-)$
		3993.0	0.39	3719.04	$(1/2,3/2)^+$
		4064.6	0.19	3647.51	$(1/2,3/2,5/2^-)$
		4131.4	0.96	3580.71	$1/2^-,3/2^-$
		4282.2	7.9	3429.80	$(3/2)^-$
		4293.9	3.1	3418.16	(1/2 to 7/2)
		4307.6	5.6	3404.41	(1/2 to 7/2)
		4405.0	0.77	3307.03	$(3/2^+)$
		4414.4	0.58	3297.62	$3/2^-$
		4611.5	3.9	3100.54	$1/2^-,3/2^-$
		4667.5	6.4	3044.52	$(5/2)^-$
		4735.1	14	2976.94	$1/2^-,3/2^-,5/2^-$
		4854.7	0.58	2857.55	$(1/2^-,3/2^-)$
7712.2	(1/2 to 7/2)	4995.1	0.19	2717.04	$3/2^-,5/2^-$
		5015.3	1.2	2696.69	$1/2^-,3/2^-,5/2^-$
		5030.4	1.2	2682.45	$(1/2^-,3/2^-)$
		5214.7	3.3	2497.26	(3/2)
		5375.4	0.19	2336.48	$5/2^-$
		5630.6	0.39	2081.32	$5/2^-$
		5649.7	1.2	2062.45	$(3/2)^-$
		5700.7	5.2	2012.274	$3/2^-$
		6164.8	8.1	1547.109	$3/2^-$
		7042.1	2.7	669.724	$1/2^-$
		7711.7	100	0.0	$3/2^-$
7732.60	(1/2)	2130.6	1.3	5602.0	(1/2 to 7/2)
		2140.94	1.7	5591.62	(1/2 to 7/2)
		2366.48	1.3	5366.07	(1/2 to 7/2)
		2397.3	2.1	5335.3	$(1/2^+)$
		2420.60	4.2	5311.95	(1/2 to 7/2)
		2458.80	0.83	5273.75	(1/2 to 7/2)
		2659.07	0.83	5073.47	(1/2 to 7/2)
		2855.88	1.3	4876.65	(1/2 to 7/2)
		2862.68	2.5	4869.85	(1/2 to 7/2)
		2922.33	1.3	4810.20	(1/2 to 7/2)
		2936.76	0.42	4795.77	$(1/2^+)$
		2943.39	3.3	4789.14	(1/2 to 7/2)
		3088.77	1.3	4643.75	(1/2 to 7/2)
		3092.5	1.3	4640.0	(1/2 to 7/2)
		3139.63	0.42	4592.89	(1/2 to 7/2)
		3226.99	2.5	4505.52	(1/2 to 7/2)
		3231.08	0.83	4501.43	(1/2 to 7/2)
		3234.06	0.83	4498.45	$5/2^-$
		3261.73	1.7	4470.78	(1/2 to 7/2)
		3312.81	2.1	4419.70	(1/2 to $7/2^-$)
		3329.54	0.83	4403.97	$(1/2^-,3/2,5/2^-)$
		3350.39	0.83	4382.11	(1/2 to 7/2)
		3374.07	1.3	4358.43	$(1/2^-,3/2^-)$
		3377.75	0.83	4354.75	$(1/2^-,3/2^-)$
		3443.01	1.3	4289.49	$1/2^-,3/2^-$
		3506.91	0.42	4225.59	$5/2^-,7/2^-$
		3584.31	1.7	4148.18	$(1/2,3/2,5/2^-)$
		3599.71	2.9	4132.78	$(1/2^-$ to $7/2^-)$
		3607.88	0.83	4124.61	(1/2 to $7/2^-$)
		3619.29	2.1	4113.20	$(1/2^+)$
		3677.65	2.5	4054.84	$1/2^-,3/2^-$

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π
7732.60	(1/2)	3715.40	2.1	4017.08	$1/2^-,3/2^-$
		3754.01	2.9	3978.47	$(1/2,3/2,5/2^-)$
		3835.03	7.1	3897.45	$(3/2^+,5/2^+)$
		3846.79	2.9	3885.68	$(5/2^+)$
		3946.94	4.2	3785.53	$1/2^-,3/2^-$
		3958.04	0.83	3774.43	$(1/2,3/2,5/2^-)$
		3992.27	3.8	3740.19	$(3/2,5/2)^+$
		4084.95	2.1	3647.51	$(1/2,3/2,5/2^-)$
		4151.74	0.83	3580.71	$1/2^-,3/2^-$
		4162.98	2.1	3569.47	
		4314.28	3.3	3418.16	(1/2 to 7/2)
		4328.03	2.1	3404.41	(1/2 to 7/2)
		4425.40	1.7	3307.03	$(3/2^+)$
		4631.88	5	3100.54	$1/2^-,3/2^-$
		4687.89	0.42	3044.52	$(5/2)^-$
		4755.47	0.42	2976.94	$1/2^-,3/2^-,5/2^-$
		4843.11	2.9	2889.29	$(1/2^-,3/2,5/2^-)$
		4875.13	1.3	2857.55	$(1/2^-,3/2^-)$
		4952.03	1.7	2780.36	$(3/2^-)$
		5035.69	2.5	2696.69	$1/2^-,3/2^-,5/2^-$
		5221.37	18	2511.903	$(3/2)^+$
		5235.11	15	2497.26	(3/2)
		5670.14	38	2062.45	$(3/2)^-$
		5721.05	13	2012.274	$3/2^-$
		6185.17	100	1547.109	$3/2^-$
		6320.14	0.42	1412.124	$5/2^-$
		7062.45	54	669.724	$1/2^-$
		7732.09	83	0.0	$3/2^-$
7745.37	(1/2 to 7/2)	1877.71	1.9	5867.63	(1/2 to 7/2)
		1941.47	0.63	5803.87	(1/2 to 7/2)
		2166.03	0.94	5579.30	(1/2 to 7/2)
		2202.6	2.2	5542.7	
		2379.25	1.9	5366.07	(1/2 to 7/2)
		2410.0	1.6	5335.3	$(1/2^+)$
		2433.37	1.6	5311.95	(1/2 to 7/2)
		2605.7	0.63	5139.6	(1/2 to 7/2)
		2728.86	0.63	5016.45	(1/2 to 7/2)
		2789.90	0.94	4955.40	$5/2^-,7/2^-$
		2868.65	0.31	4876.65	(1/2 to 7/2)
		2875.45	1.9	4869.85	(1/2 to 7/2)
		2939.07	1.3	4806.23	$(1/2^+)$
		2949.53	0.63	4795.77	$(1/2^+)$
7745.37	(1/2 to 7/2)	2956.16	1.3	4789.14	(1/2 to 7/2)
		2992.63	0.94	4752.66	
		3101.54	0.94	4643.75	(1/2 to 7/2)
		3105.3	2.5	4640.0	(1/2 to 7/2)
		3152.40	1.6	4592.89	(1/2 to 7/2)
		3213.89	1.3	4531.39	(1/2 to 7/2)
		3239.76	0.63	4505.52	(1/2 to 7/2)
		3243.85	0.63	4501.43	(1/2 to 7/2)
		3246.83	0.94	4498.45	$5/2^-$
		3274.50	1.3	4470.78	(1/2 to 7/2)
		3288.26	0.63	4457.02	$(1/2,3/2,5/2^-)$
		3325.58	1.3	4419.70	(1/2 to $7/2^-$)
		3342.31	2.8	4403.97	$(1/2^-,3/2,5/2^-)$
		3363.16	1.6	4382.11	(1/2 to 7/2)
		3386.84	0.63	4358.43	$(1/2^-,3/2^-)$
		3390.52	2.8	4354.75	$(1/2^-,3/2^-)$
		3455.78	0.63	4289.49	$1/2^-,3/2^-$
		3519.67	3.8	4225.59	$5/2^-,7/2^-$
		3597.08	4.4	4148.18	$(1/2,3/2,5/2^-)$
		3612.48	2.2	4132.78	($1/2^-$ to $7/2^-$)
		3620.65	0.94	4124.61	(1/2 to $7/2^-$)
		3766.78	3.4	3978.47	$(1/2,3/2,5/2^-)$
		3847.79	1.6	3897.45	$(3/2^+,5/2^+)$
		3859.56	1.3	3885.68	$(5/2^+)$
		3959.71	1.6	3785.53	$1/2^-,3/2^-$
		3970.81	2.2	3774.43	$(1/2,3/2,5/2^-)$
		4005.04	3.4	3740.19	$(3/2,5/2)^+$
		4026.19	1.9	3719.04	$(1/2,3/2)^+$
		4097.72	1.6	3647.51	$(1/2,3/2,5/2^-)$
		4164.51	1.6	3580.71	$1/2^-,3/2^-$
		4280.21	0.94	3465.00	$1/2^-,3/2^-$
		4315.41	1.3	3429.80	$(3/2)^-$
		4327.05	9.4	3418.16	(1/2 to 7/2)
		4438.17	1.3	3307.03	$(3/2^+)$
		4447.58	3.4	3297.62	$3/2^-$
		4644.65	3.1	3100.54	$1/2^-,3/2^-$
		4768.24	3.8	2976.94	$1/2^-,3/2^-,5/2^-$
		4855.88	3.4	2889.29	$(1/2^-,3/2,5/2^-)$
		4887.90	1.9	2857.55	$(1/2^-,3/2^-)$
		4938.6	0.31	2808.14	$3/2^-$
		4964.80	2.5	2780.36	$(3/2^-)$
		5048.46	1.3	2696.69	$1/2^-,3/2^-,5/2^-$

From ENSDF

$^{63}_{29}Cu_{34}$-56

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f
7745.37	(1/2 to 7/2)	5063.6	12	2682.45	$(1/2^-,3/2^-)$
		5234.14	11	2511.903	$(3/2)^+$
		5247.88	3.8	2497.26	(3/2)
		5663.78	0.63	2081.32	$5/2^-$
		5682.91	6.9	2062.45	$(3/2)^-$
		5733.82	20	2012.274	$3/2^-$
		6197.93	31	1547.109	$3/2^-$
		6332.90	3.4	1412.124	$5/2^-$
		6782.83	1.9	962.145	$5/2^-$
		7075.22	23	669.724	$1/2^-$
		7744.86	100	0.0	$3/2^-$
7772.7	(1/2 to 7/2)	2193.4	0.73	5579.30	(1/2 to 7/2)
		2699.2	0.49	5073.47	(1/2 to 7/2)
		2719.6	0.73	5053.0	(1/2 to 7/2)
		2756.2	1.2	5016.45	(1/2 to 7/2)
		2962.4	0.24	4810.20	(1/2 to 7/2)
		2966.4	0.49	4806.23	$(1/2^+)$
		3020.0	0.24	4752.66	
		3132.6	0.98	4640.0	(1/2 to 7/2)
		3179.7	0.73	4592.89	(1/2 to 7/2)
		3241.2	0.98	4531.39	(1/2 to 7/2)
		3255.5	0.24	4517.15	$(1/2,3/2,5/2^-)$
		3271.2	0.24	4501.43	(1/2 to 7/2)
		3274.2	0.24	4498.45	$5/2^-$
		3315.6	0.24	4457.02	$(1/2,3/2,5/2^-)$
		3352.9	1.5	4419.70	$(1/2\ to\ 7/2^-)$
		3414.2	1.7	4358.43	$(1/2^-,3/2^-)$
		3483.1	0.73	4289.49	$1/2^-,3/2^-$
		3487.6	0.49	4285.03	$5/2^-,7/2^-$
		3547.0	4.2	4225.59	$5/2^-,7/2^-$
		3624.4	0.24	4148.18	$(1/2,3/2,5/2^-)$
		3627.3	0.73	4145.1	$(1/2^-\ to\ 7/2^-)$
		3639.8	2.0	4132.78	$(1/2^-\ to\ 7/2^-)$
		3648.0	0.73	4124.61	$(1/2\ to\ 7/2^-)$
		3659.4	0.24	4113.20	$(1/2^+)$
		3755.5	0.98	4017.08	$1/2^-,3/2^-$
		3794.1	1.5	3978.47	$(1/2,3/2,5/2^-)$
		3875.1	0.24	3897.45	$(3/2^+,5/2^+)$
		3886.9	0.24	3885.68	$(5/2^+)$
		3906.0	1.2	3866.55	$(1/2^-\ to\ 7/2)$
		3987.0	5.1	3785.53	$1/2^-,3/2^-$
		3998.1	0.49	3774.43	$(1/2,3/2,5/2^-)$

From ENSDF
$^{63}_{29}Cu_{34}$-57

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
7772.7	(1/2 to 7/2)	4032.4	2.4	3740.19	$(3/2,5/2)^+$		
		4053.5	1.7	3719.04	$(1/2,3/2)^+$		
		4191.8	1.2	3580.71	$1/2^-,3/2^-$		
		4203.1	0.49	3569.47			
		4231.3	0.98	3541.3	$(1/2^-$ to 7/2)		
		4298.0	0.49	3474.59	$5/2^+$		
		4307.5	0.98	3465.00	$1/2^-,3/2^-$		
		4342.7	1.5	3429.80	$(3/2)^-$		
		4354.4	0.49	3418.16	(1/2 to 7/2)		
		4368.1	2.0	3404.41	(1/2 to 7/2)		
		4465.5	1.2	3307.03	$(3/2^+)$		
		4474.9	0.73	3297.62	$3/2^-$		
		4672.0	1.2	3100.54	$1/2^-,3/2^-$		
		4728.0	3.2	3044.52	$(5/2)^-$		
		4795.6	0.98	2976.94	$1/2^-,3/2^-,5/2^-$		
		4883.2	0.49	2889.29	$(1/2^-,3/2,5/2^-)$		
		4915.2	0.49	2857.55	$(1/2^-,3/2^-)$		
		4992.1	0.49	2780.36	$(3/2^-)$		
		5055.6	0.49	2717.04	$3/2^-,5/2^-$		
		5075.8	1.7	2696.69	$1/2^-,3/2^-,5/2^-$		
		5090.9	0.73	2682.45	$(1/2^-,3/2^-)$		
		5262.0	10	2511.903	$(3/2)^+$		
		5275.2	1.2	2497.26	(3/2)		
		5691.1	1.7	2081.32	$5/2^-$		
		5710.2	12	2062.45	$(3/2)^-$		
		5761.1	2.2	2012.274	$3/2^-$		
		6225.3	46	1547.109	$3/2^-$		
		7102.6	16	669.724	$1/2^-$		
		7772.2	100	0.0	$3/2^-$		
8364.7	$(25/2^+)$	1291.8 *3*	100	7073.71	$(23/2^+)$	D	E_γ: from (^{18}O,αp2nγ).
8564.66	$1/2^-$	4790.04	12	3774.43	$(1/2,3/2,5/2^-)$		
		4907.7	20	3656.8	$(1/2,3/2,5/2^-)$		
		5103.1	17	3461.3	$5/2^+$		
		5134.64	22	3429.80	$(3/2)^-$		
		5160.02	16	3404.41	(1/2 to 7/2)		
		5254.8	34	3309.6	$(3/2^+,5/2^+)$		
		5272.0	26	3292.4	$(3/2^+,5/2^+)$		
		5300.8	6.9	3263.7	$(5/2^-)$		
		5339.1	22	3225.3	$5/2^-$		
		5463.87	20	3100.54	$1/2^-,3/2^-$		
		5519.88	16	3044.52	$(5/2)^-$		
		5587.45	12	2976.94	$1/2^-,3/2^-,5/2^-$		

From ENSDF

$^{63}_{29}Cu_{34}$-58

Adopted Levels, Gammas (continued)

$\gamma(^{63}Cu)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]
8564.66	1/2$^-$	5608.2	15	2958.90			
		5677.3	15	2889.29	(1/2$^-$,3/2,5/2$^-$)		
		5867.68	23	2696.69	1/2$^-$,3/2$^-$,5/2$^-$		
		5885.8	45	2678.07	(5/2$^-$,7/2$^-$)		
		6028.42	3.5	2535.83	5/2$^-$		
		6067.09	45	2497.26	(3/2)		
		6159.6	8.3	2404.77	7/2$^-$		
		6502.11	35	2062.45	(3/2)$^-$		
		6553.02	17	2012.274	3/2$^-$		
		7017.13	77	1547.109	3/2$^-$		
		7152.10	25	1412.124	5/2$^-$		
		7602.02	12	962.145	5/2$^-$		
		7894.41	50	669.724	1/2$^-$		
		8564.04	100	0.0	3/2$^-$		
8628.8	(5/2$^-$)	5319.0	33	3309.6	(3/2$^+$,5/2$^+$)		
		5797.2	44	2832.95	(7/2$^-$)		
		6617.2	61	2012.274	3/2$^-$		
		6767.1	44	1861.34	7/2$^-$		
		7081.3	100	1547.109	3/2$^-$		
		7216.2	50	1412.124	5/2$^-$		
		7301.3	50	1326.014	7/2$^-$		
		7666.2	89	962.145	5/2$^-$		
		7958.5	11	669.724	1/2$^-$		
		8628.2	78	0.0	3/2$^-$		
8639.32	(5/2$^-$)	5329.2	55	3309.6	(3/2$^+$,5/2$^+$)		
		5346.4	25	3292.4	(3/2$^+$,5/2$^+$)		
		5375.2	29	3263.7	(5/2$^-$)		
		5413.5	20	3225.3	5/2$^-$		
		5510.0	20	3128.1	$^-$		
		5538.2	20	3100.54	1/2$^-$,3/2$^-$		
		5594.2	35	3044.52	(5/2)$^-$		
		5751.6	15	2889.29	(1/2$^-$,3/2,5/2$^-$)		
		5858.4	26	2780.36	(3/2$^-$)		
		5960.1	18	2678.07	(5/2$^-$,7/2$^-$)		
		6102.8	49	2535.83	5/2$^-$		
		6141.4	33	2497.26	(3/2)		
		6302.1	19	2336.48	5/2$^-$		
		6557.3	25	2081.32	5/2$^-$		
		6576.5	25	2062.45	(3/2)$^-$		
		6627.4	18	2012.274	3/2$^-$		
		7091.5	58	1547.109	3/2$^-$	D+Q[a]	−0.38[a] *+9−2*
		7226.4	64	1412.124	5/2$^-$	D+Q[a]	−0.2[a] *1*

From ENSDF

$^{63}_{29}Cu_{34}$-59

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]
8639.32	(5/2$^-$)	7311.5	31	1326.014	7/2$^-$	D(+Q)[a]	−0.09[a] *11*
		7676.4	62	962.145	5/2$^-$	D+Q[a]	−0.2[a] *1*
		7968.7	23	669.724	1/2$^-$		
		8638.4	100	0.0	3/2$^-$	D+Q[a]	−0.20[a] *1*
8693.7	(3/2$^-$)	6682.1	35	2012.274	3/2$^-$		
		8023.4	19	669.724	1/2$^-$		
		8693.1	100	0.0	3/2$^-$		
8700.9	(3/2$^-$)	7288.1	40	1412.124	5/2$^-$		
		8030.4	80	669.724	1/2$^-$		
		8700.1	100	0.0	3/2$^-$		
8718.6	(3/2$^-$)	7755.9	7.5	962.145	5/2$^-$		
		8718.0	100	0.0	3/2$^-$		
8719.1	(3/2$^-$)	7756.4	100	962.145	5/2$^-$		
		8718.5	75	0.0	3/2$^-$		
8719.2	(3/2$^-$)	6626.4	100	2092.48	7/2$^-$		
		6637.5	40	2081.32	5/2$^-$		
		6857.5	64	1861.34	7/2$^-$		
		7171.7	84	1547.109	3/2$^-$		
		7756.5	56	962.145	5/2$^-$		
		8718.6	56	0.0	3/2$^-$		
8727.5	(3/2$^-$)	6645.8	17	2081.32	5/2$^-$		
		6664.9	10	2062.45	(3/2)$^-$		
		7314.9	12	1412.124	5/2$^-$		
		8057.2	28	669.724	1/2$^-$		
		8726.9	100	0.0	3/2$^-$		
8731.7	(3/2$^-$)	7319.1	31	1412.124	5/2$^-$		
		7769.0	100	962.145	5/2$^-$		
		8731.1	8.3	0.0	3/2$^-$		
8734.6	(3/2$^-$)	7187.1	90	1547.109	3/2$^-$		
		7771.9	100	962.145	5/2$^-$		
		8064.3	23	669.724	1/2$^-$		
		8734.0	38	0.0	3/2$^-$		
8738.6	(3/2$^-$)	6676.0	62	2062.45	(3/2)$^-$		
		6726.9	53	2012.274	3/2$^-$		
		7775.9	100	962.145	5/2$^-$		
		8068.3	38	669.724	1/2$^-$		
		8738.0	38	0.0	3/2$^-$		
8743.2	(3/2$^-$)	7195.7	23	1547.109	3/2$^-$		
		7330.6	77	1412.124	5/2$^-$		
		7780.5	54	962.145	5/2$^-$		
		8742.6	100	0.0	3/2$^-$		

From ENSDF

$^{63}_{29}Cu_{34}$-60

Adopted Levels, Gammas (continued)

γ(^{63}Cu) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
8743.7	(3/2$^-$)	7196.1	44	1547.109	3/2$^-$			
		7331.0	34	1412.124	5/2$^-$			
		7780.9	100	962.145	5/2$^-$			
		8073.3	53	669.724	1/2$^-$			
		8743.0	81	0.0	3/2$^-$			
8746.6	(3/2$^-$)	7783.9	100	962.145	5/2$^-$			
		8076.3	60	669.724	1/2$^-$			
		8746.0	62	0.0	3/2$^-$			
8747.6	(3/2$^-$)	7784.9	100	962.145	5/2$^-$			
		8077.3	42	669.724	1/2$^-$			
		8747.0	27	0.0	3/2$^-$			
8750.5	(3/2$^-$)	7203.1	25	1547.109	3/2$^-$			
		7787.9	10	962.145	5/2$^-$			
		8080.3	12	669.724	1/2$^-$			
		8750.0	100	0.0	3/2$^-$			
9489.5		2416.6 *5*		7073.71	(23/2$^+$)			E_γ: from (^{18}O,αp2nγ).
9811.2	9/2$^+$	7302		2505.08	9/2$^+$			
9834.2		7325		2505.08	9/2$^+$			
9846.2	9/2$^+$	7337		2505.08	9/2$^+$	(M1)		Mult.: D from asymmetry in (p,γ):E=res; Δπ=no from level scheme.
9850.3	9/2$^+$	7341		2505.08	9/2$^+$	(M1+E2)	−1.2 *5*	Mult.,δ: D+Q from A_2=+0.32 *13*, A_4=−0.28 *13* (1979Vo01); Δπ=no from level scheme. Other: D from asymmetry=0.60 *10* (1972Sz01).
9855.5	9/2$^+$	7348	100	2505.08	9/2$^+$	(M1(+E2))	0.1 *1*	Mult.,δ: D(+Q) from γ(θ) in (p,γ):E=res; Δπ=no from level scheme.
9865		7354	100 *1*	2511.903	(3/2)$^+$			Mult.,δ: δ(Q/D)=−1.26 if J(9865)=9/2 in (p,γ):E=res.
		7458	4.18 *29*	2404.77	7/2$^-$			
		7770	5.19 *29*	2092.48	7/2$^-$			
		8001	3.31 *29*	1861.34	7/2$^-$			
		8315	2.88 *29*	1547.109	3/2$^-$			
		8450	4.0 *4*	1412.124	5/2$^-$			
		8535	4.2 *4*	1326.014	7/2$^-$			
		8900	8.8 *4*	962.145	5/2$^-$			
		9193	4.90 *29*	669.724	1/2$^-$			
		9862	6.77 *29*	0.0	3/2$^-$			

† Additional information 2.

‡ From (n,n′γ) up to 5835 level and from (p,γ):E=res for others, unless otherwise noted. Note that Eγ values quoted from (p,γ):E=res are deduced from level-energy differences with the precise level energies determined based on the precisely measured Eγ values which are however not explicitly listed by the authors of the source references in (p,γ):E=res.

From γ(θ) in (p,p′γ) up to 2536 level, and from γγ(DCO) and γ(lin pol) in (^{18}O,αp2nγ) above that, unless otherwise noted. RUL and measured $T_{1/2}$ where available are used to determine magnetic and electric characters of a transition where γ(lin pol) data are not available.

From ENSDF

$^{63}_{29}Cu_{34}$-61

γ(^{63}Cu) (continued)

@ From (^{18}O,αp2nγ).
& From (p,γ):E=res.
[a] From $\gamma(\theta)$ in (p,γ):E=res.
[b] Placement of transition in the level scheme is uncertain.

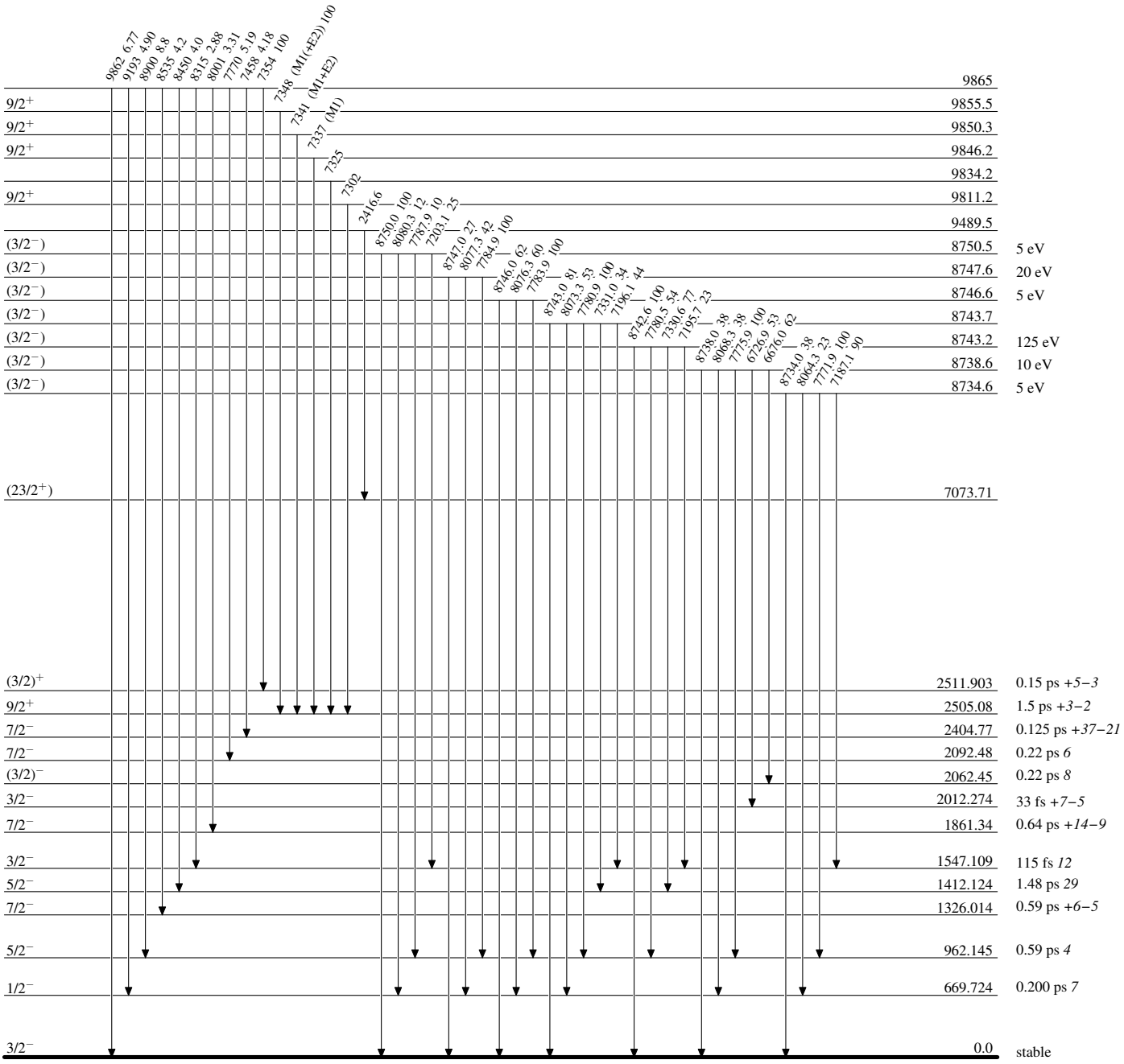
From ENSDF

$^{63}_{29}$Cu$_{34}$-62

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

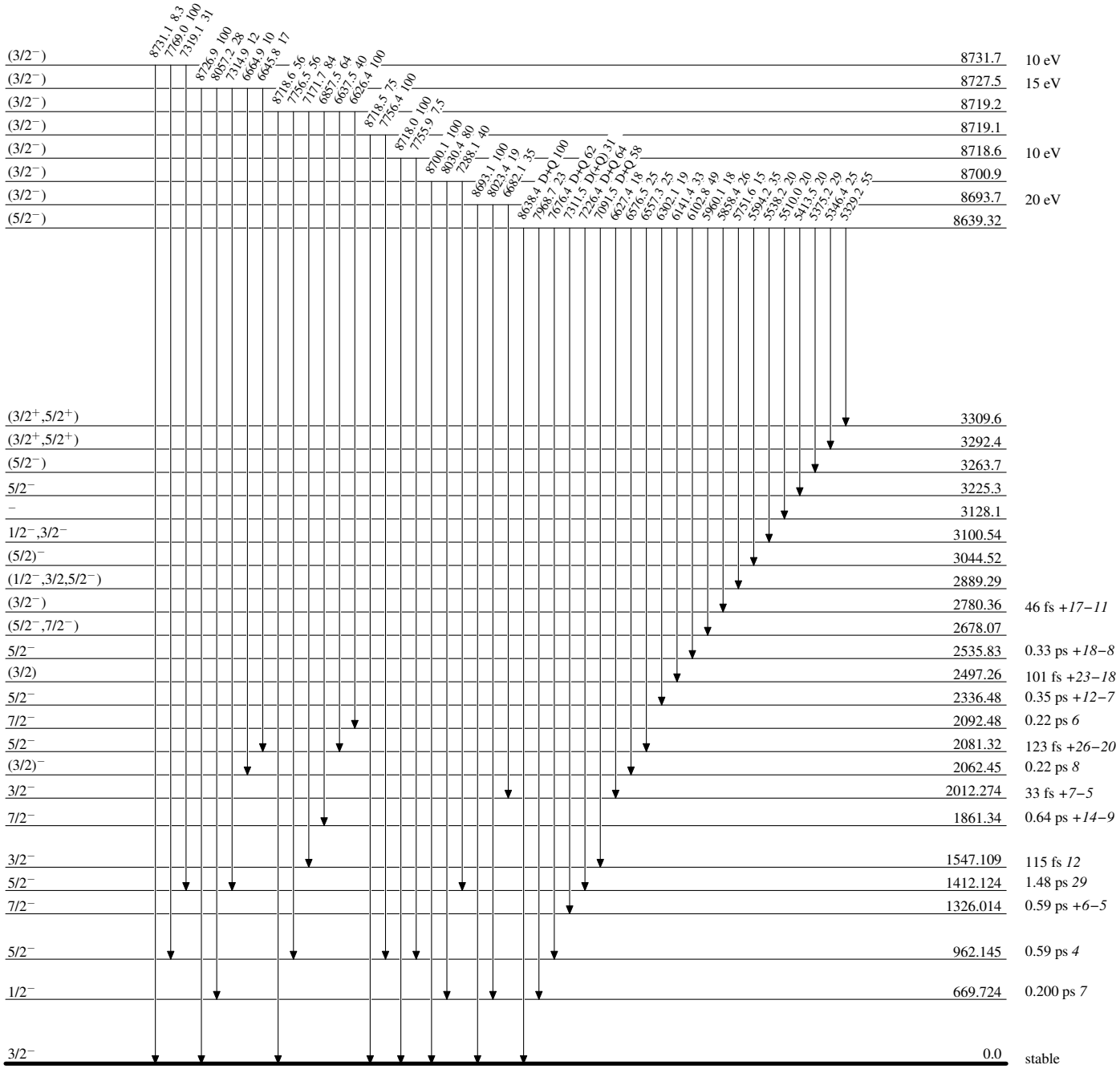


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

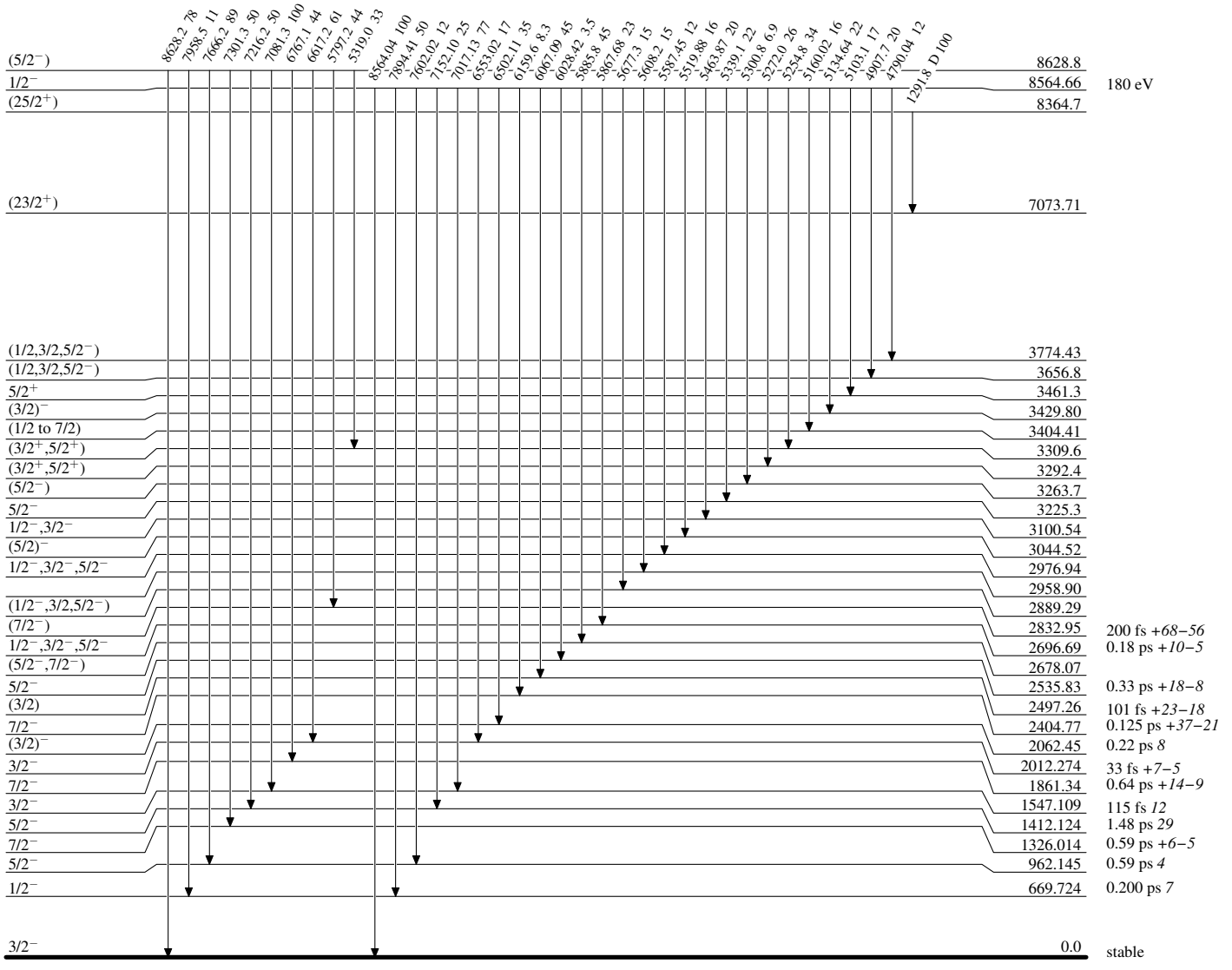


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

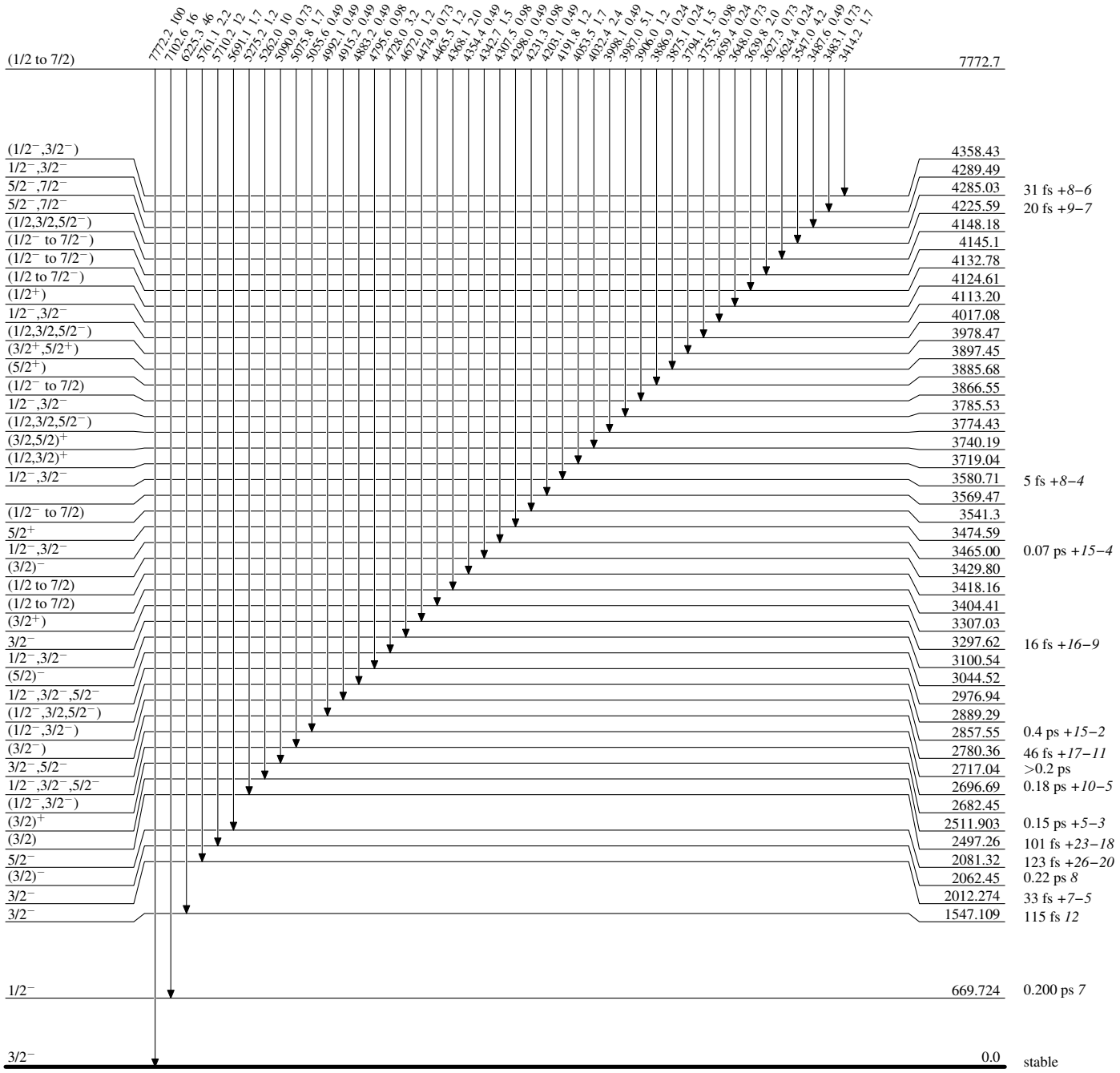


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

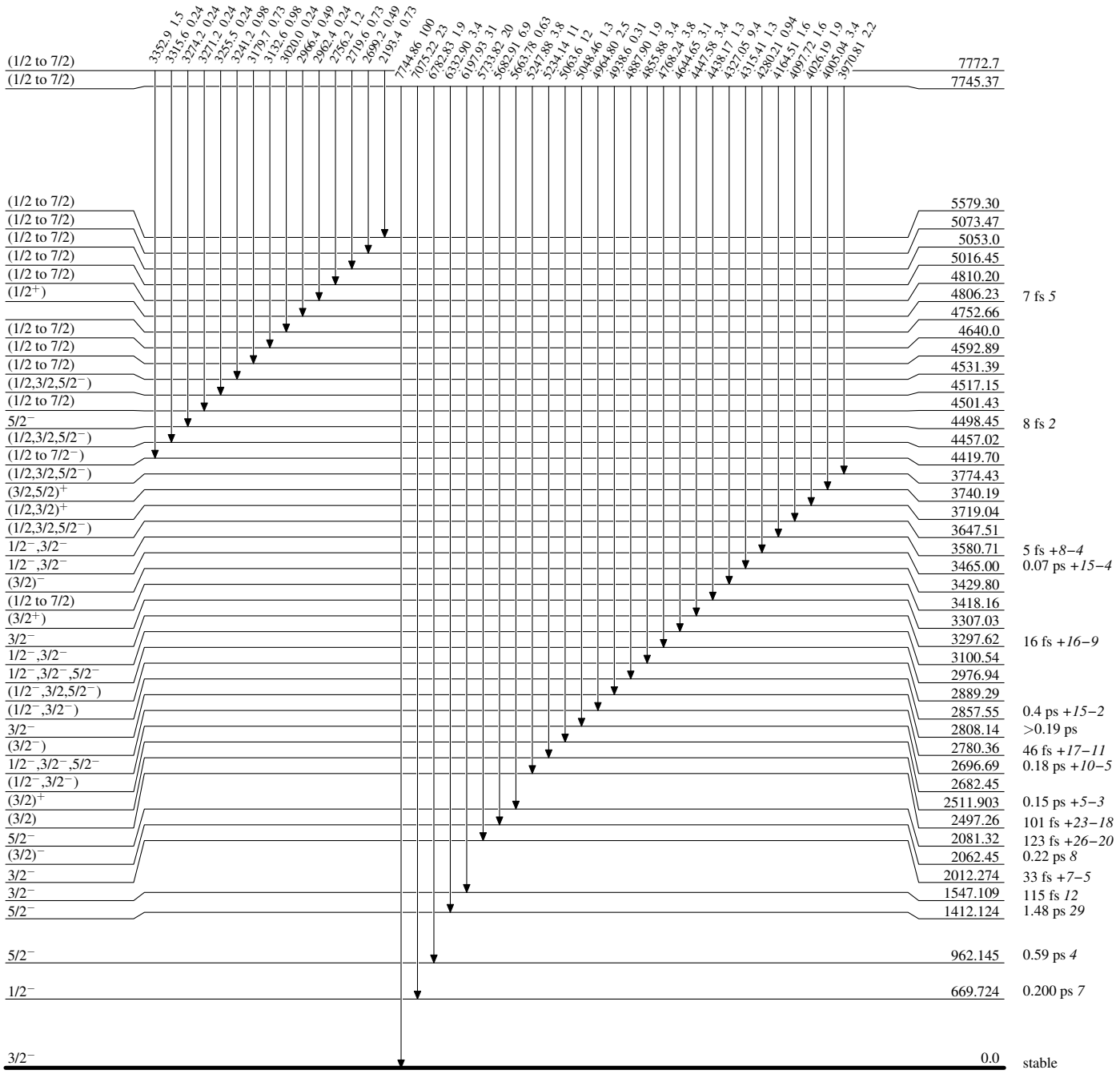


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

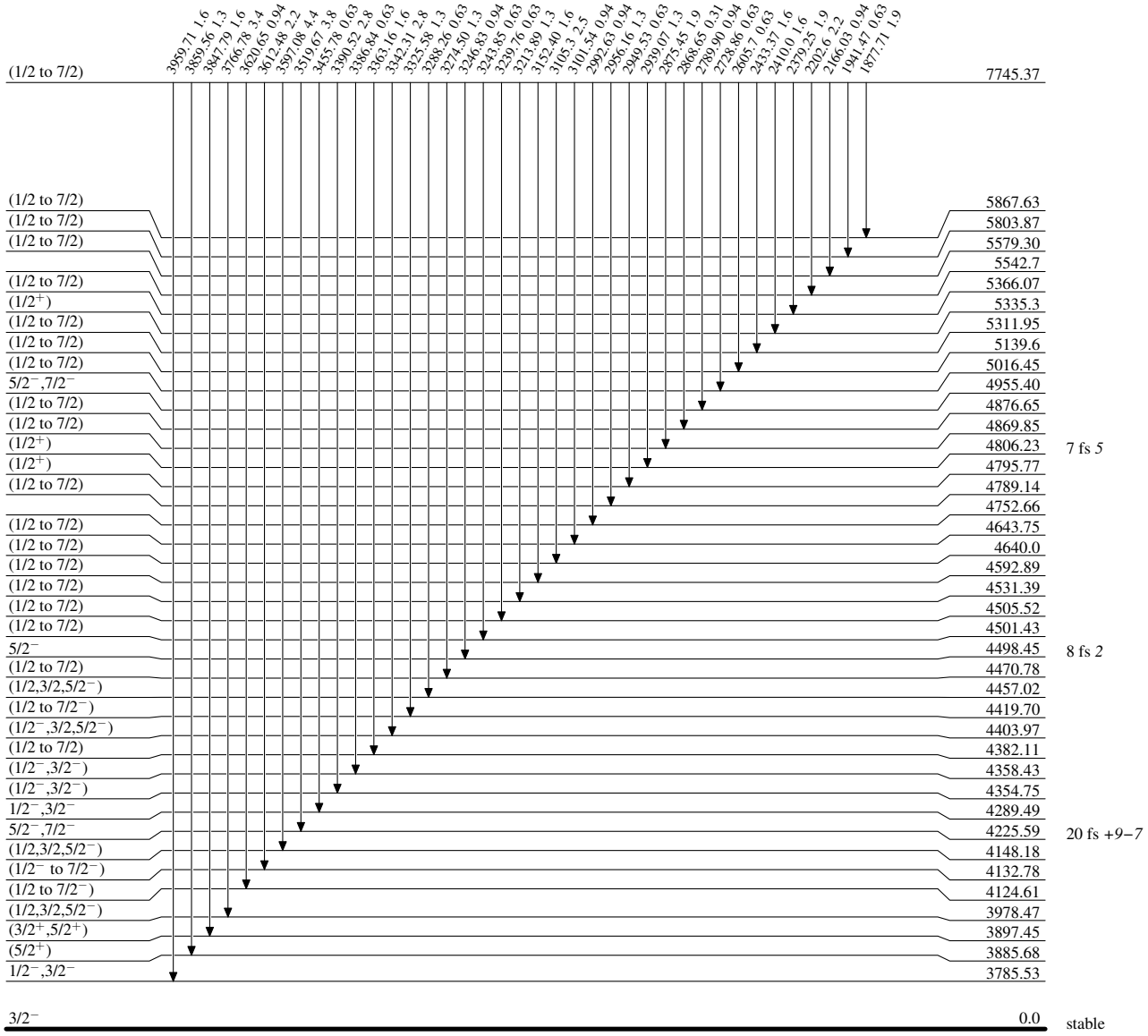


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

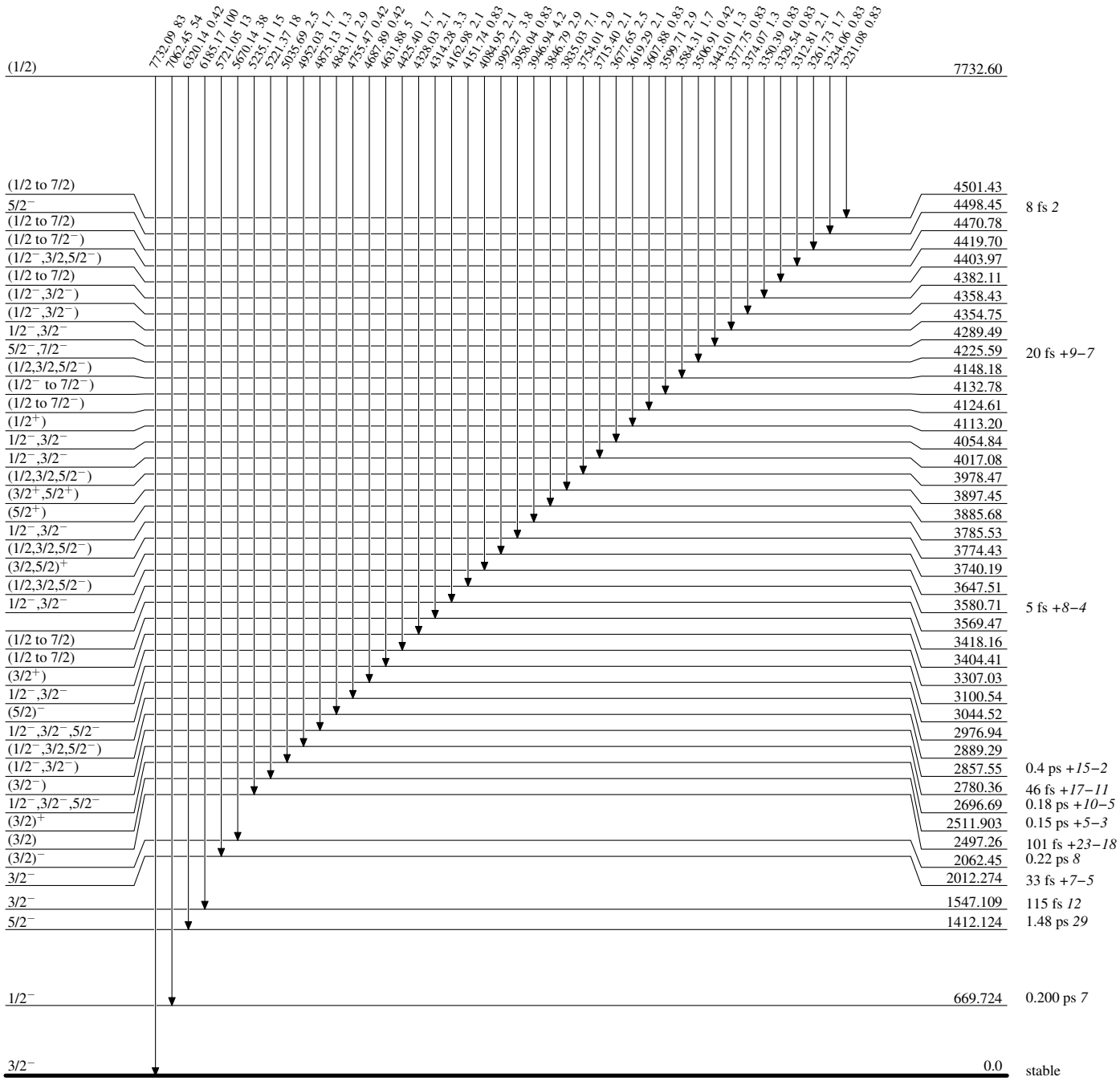


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

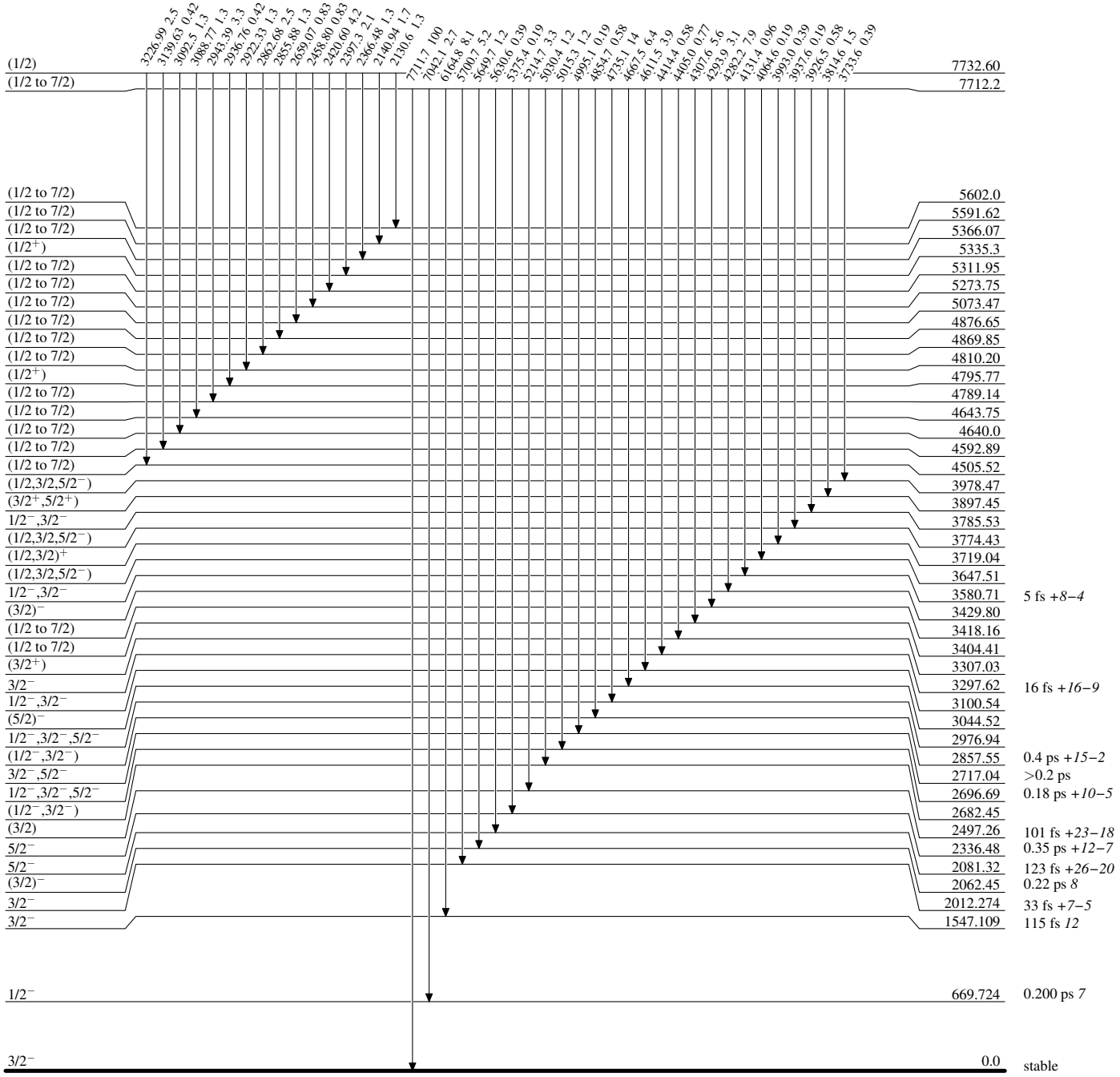


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

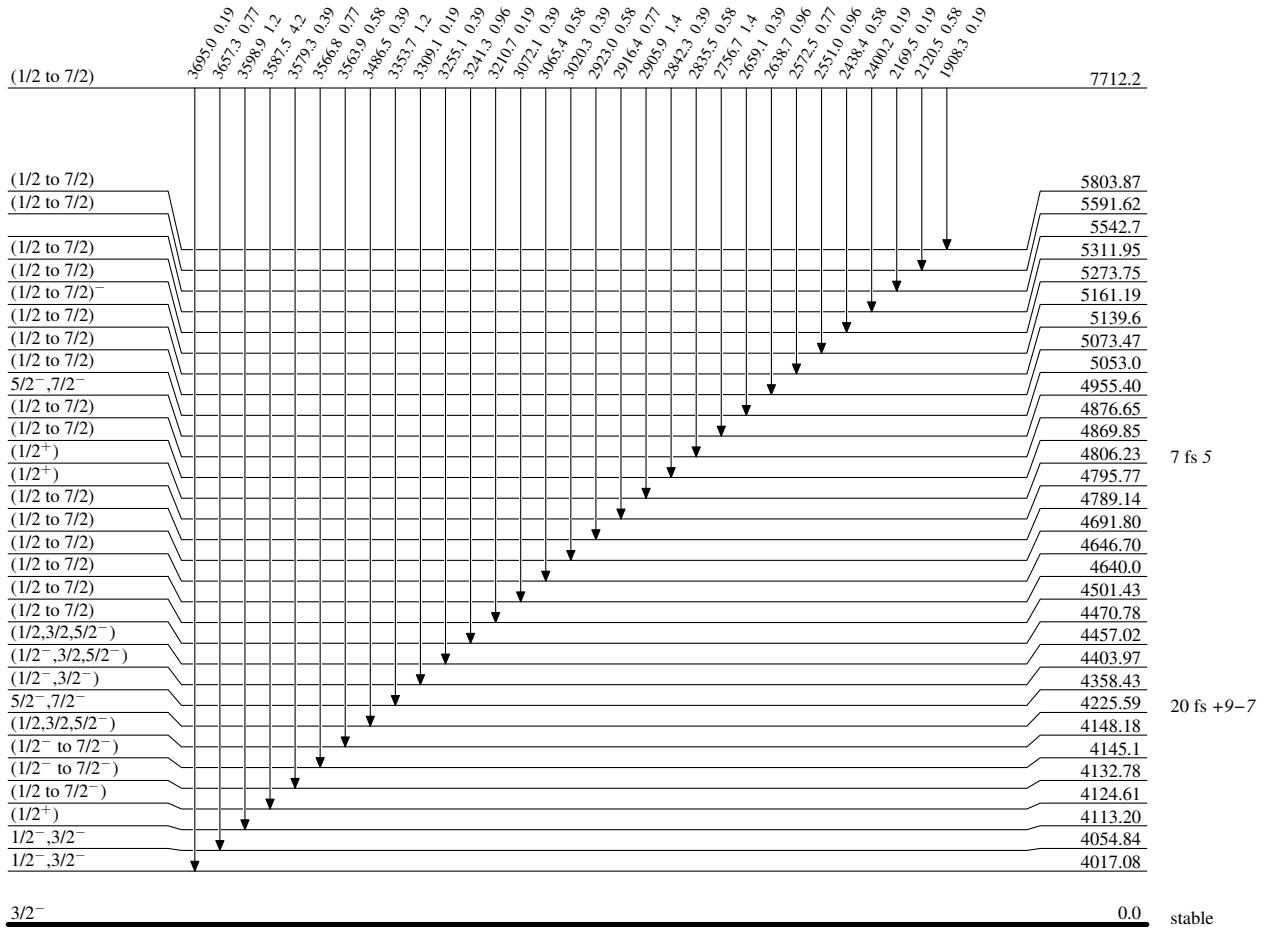


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

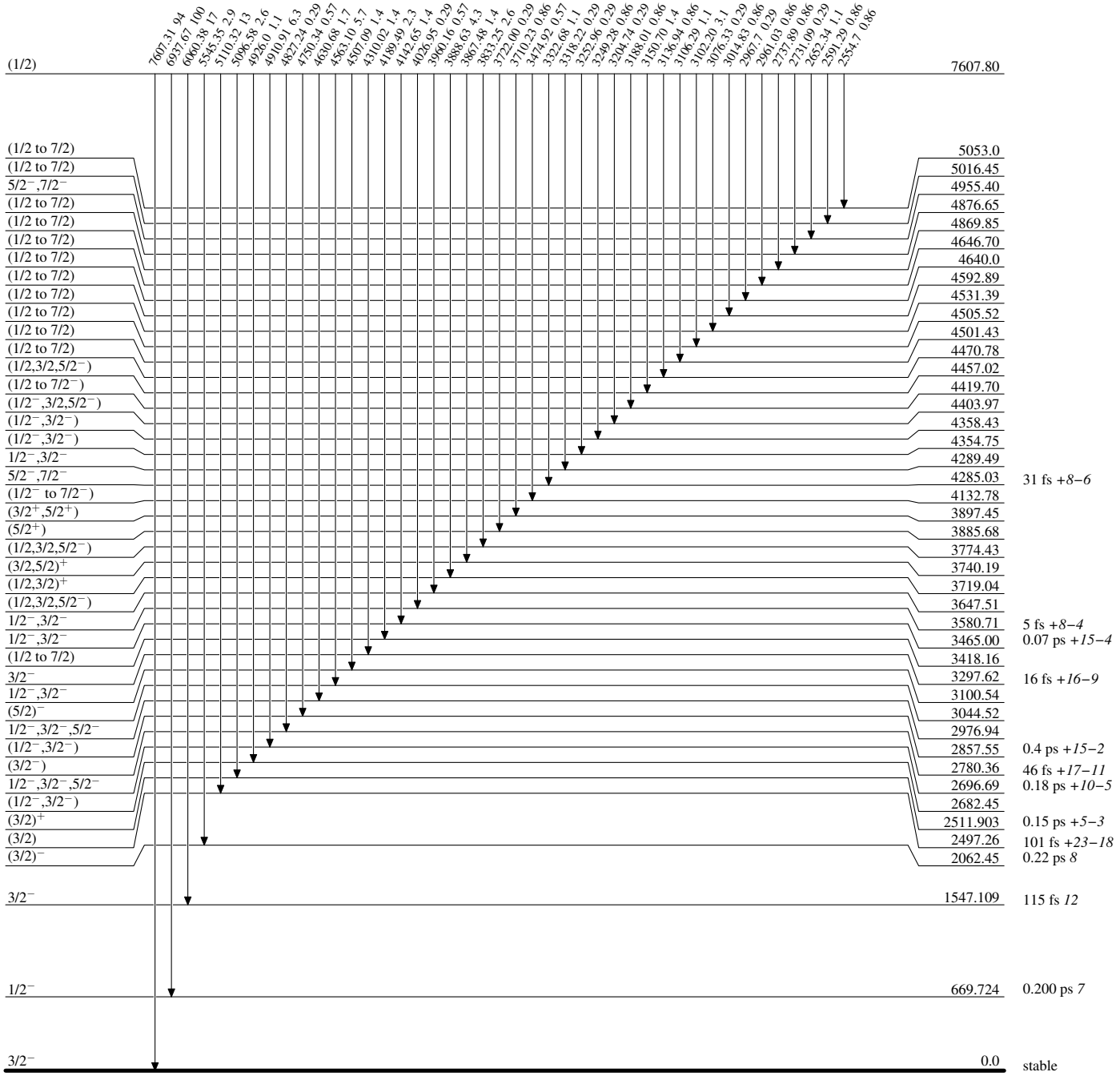


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

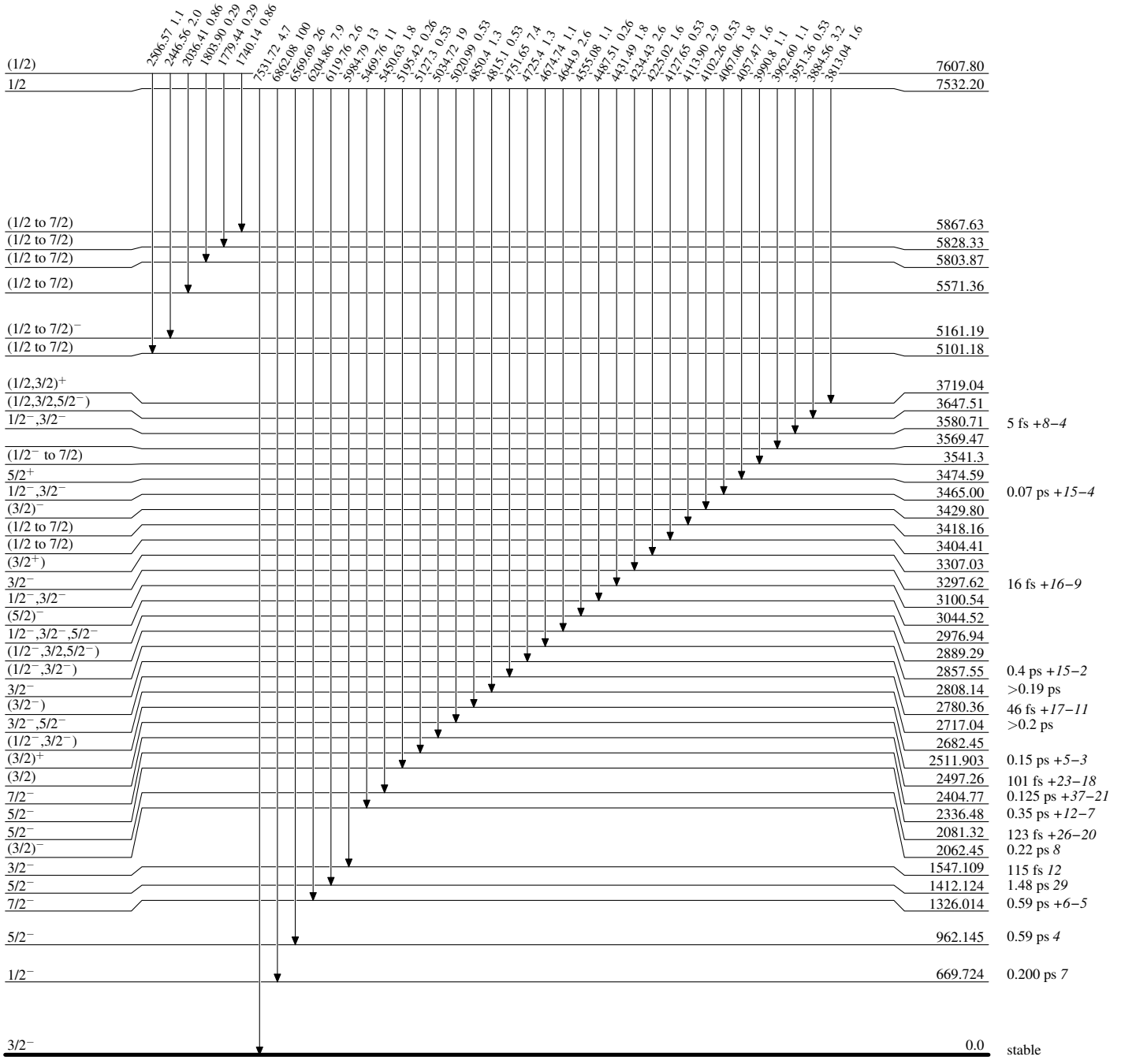


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

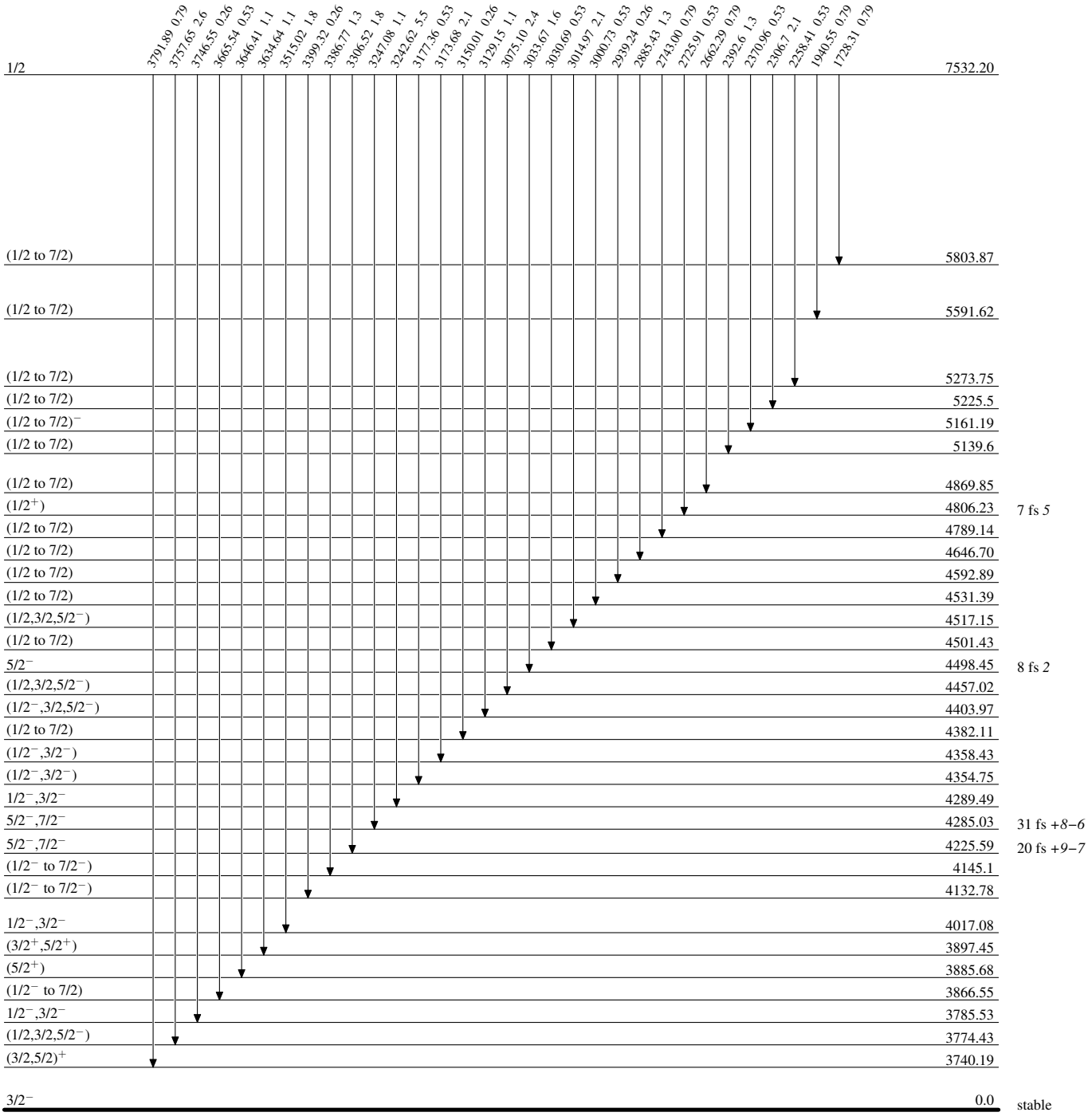


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

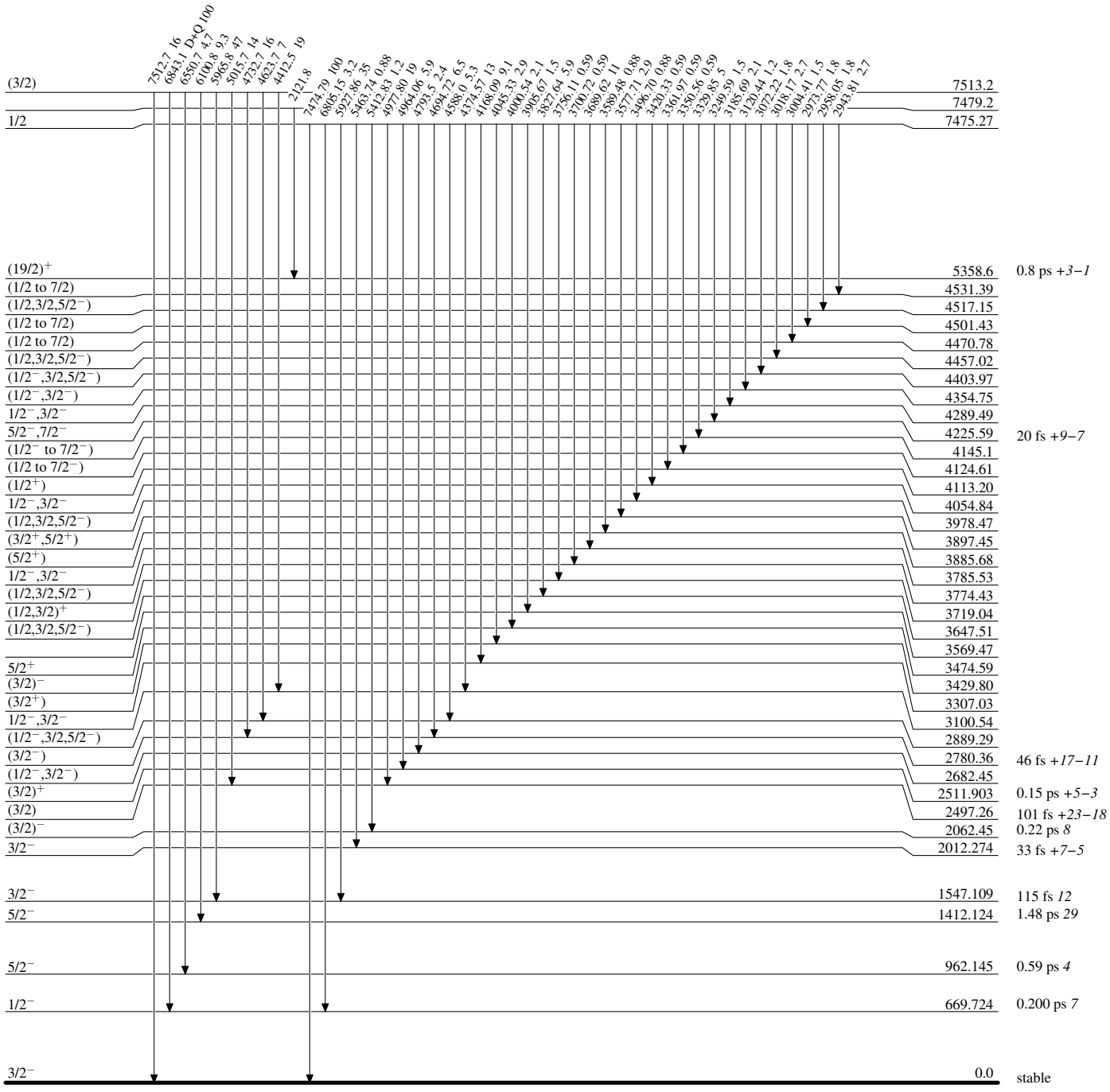


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

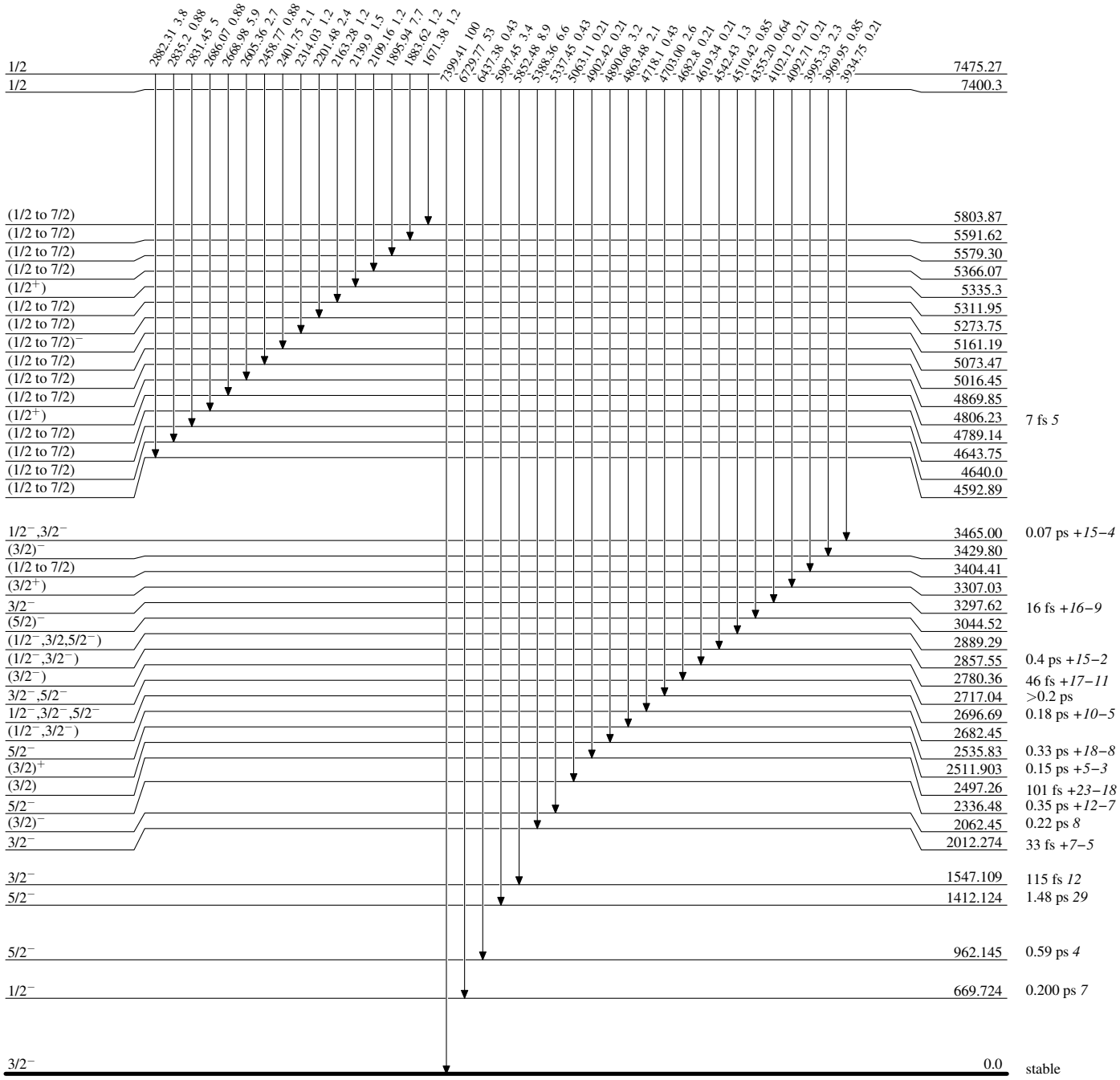


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

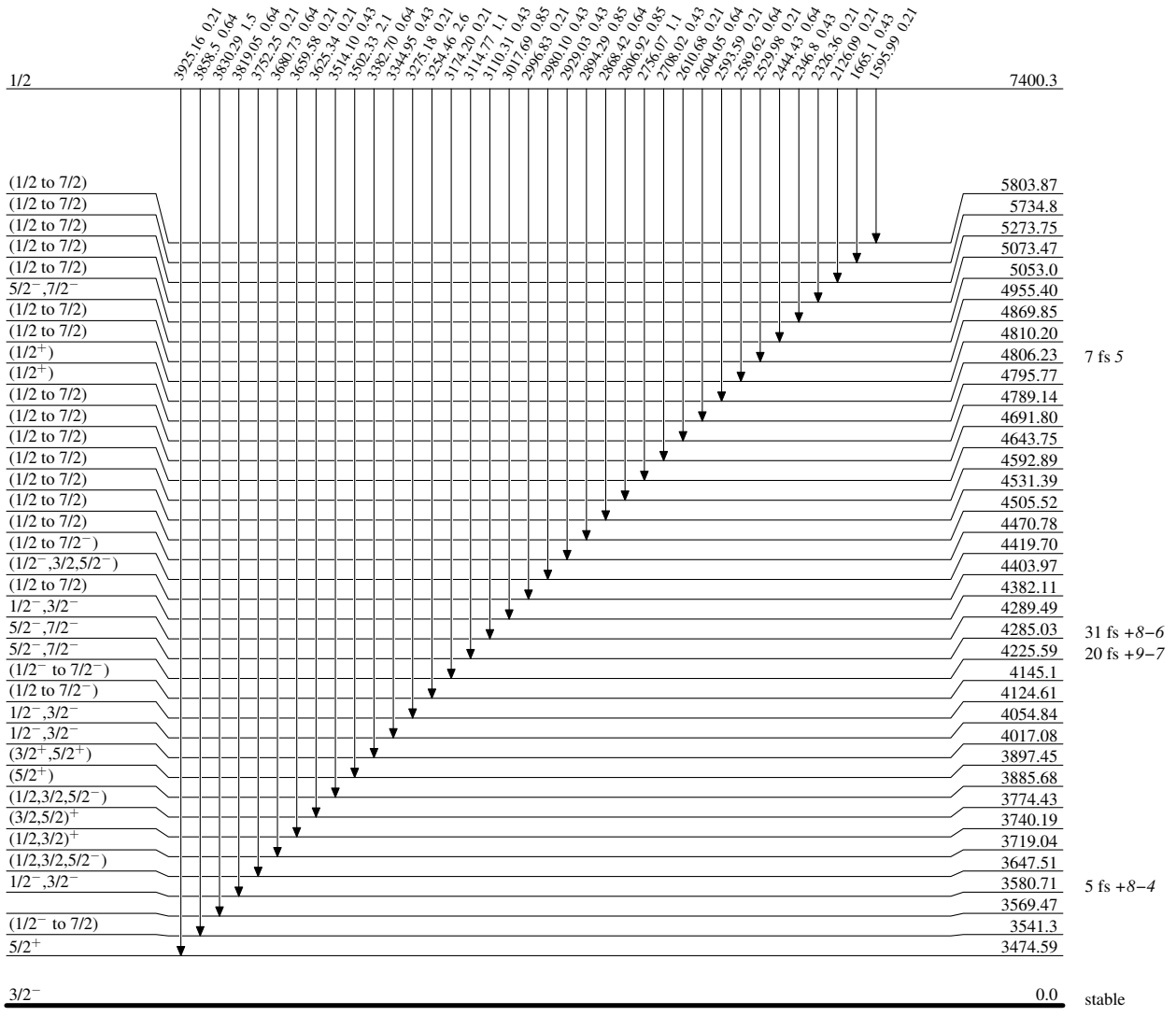


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

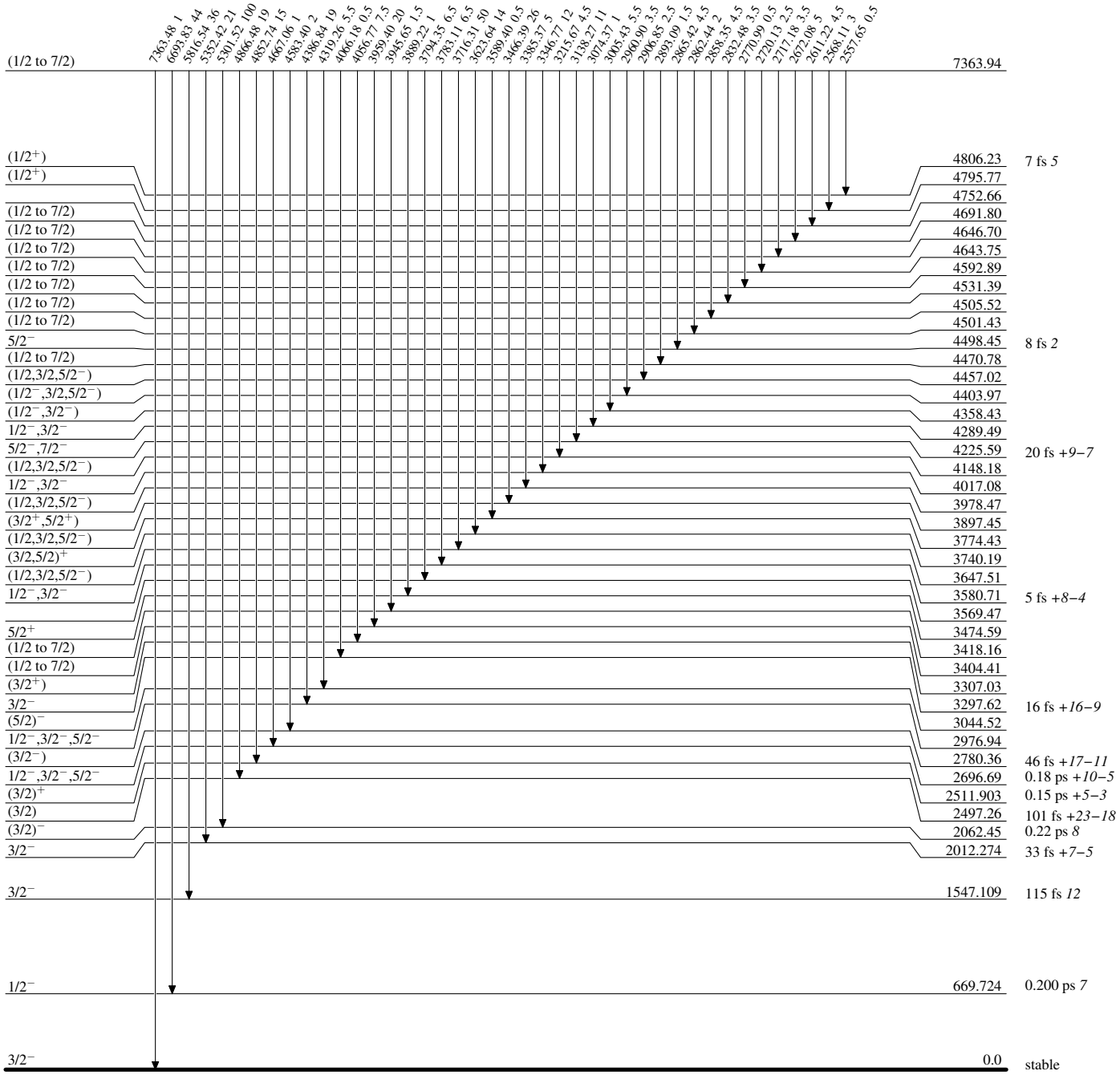


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

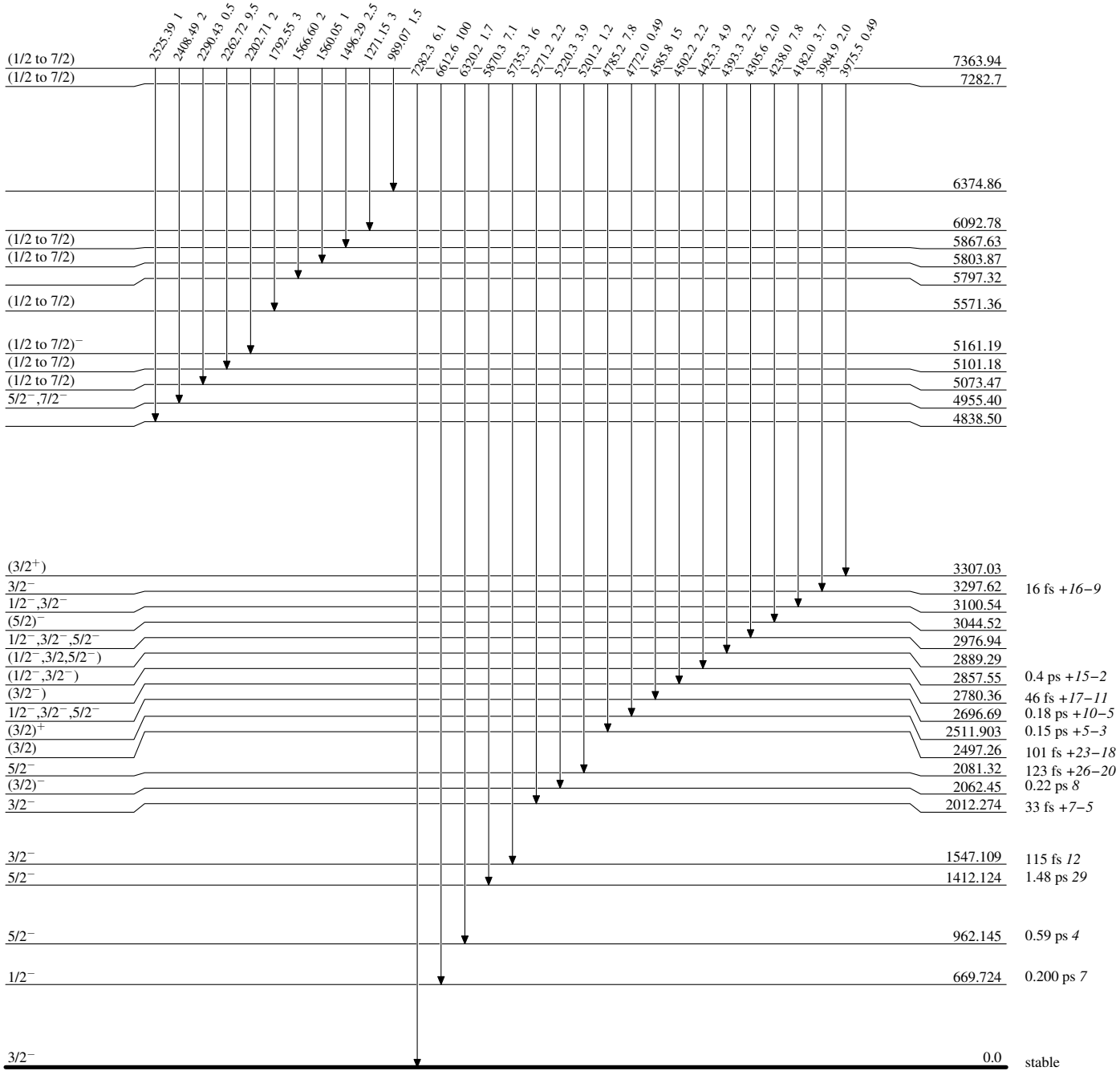


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

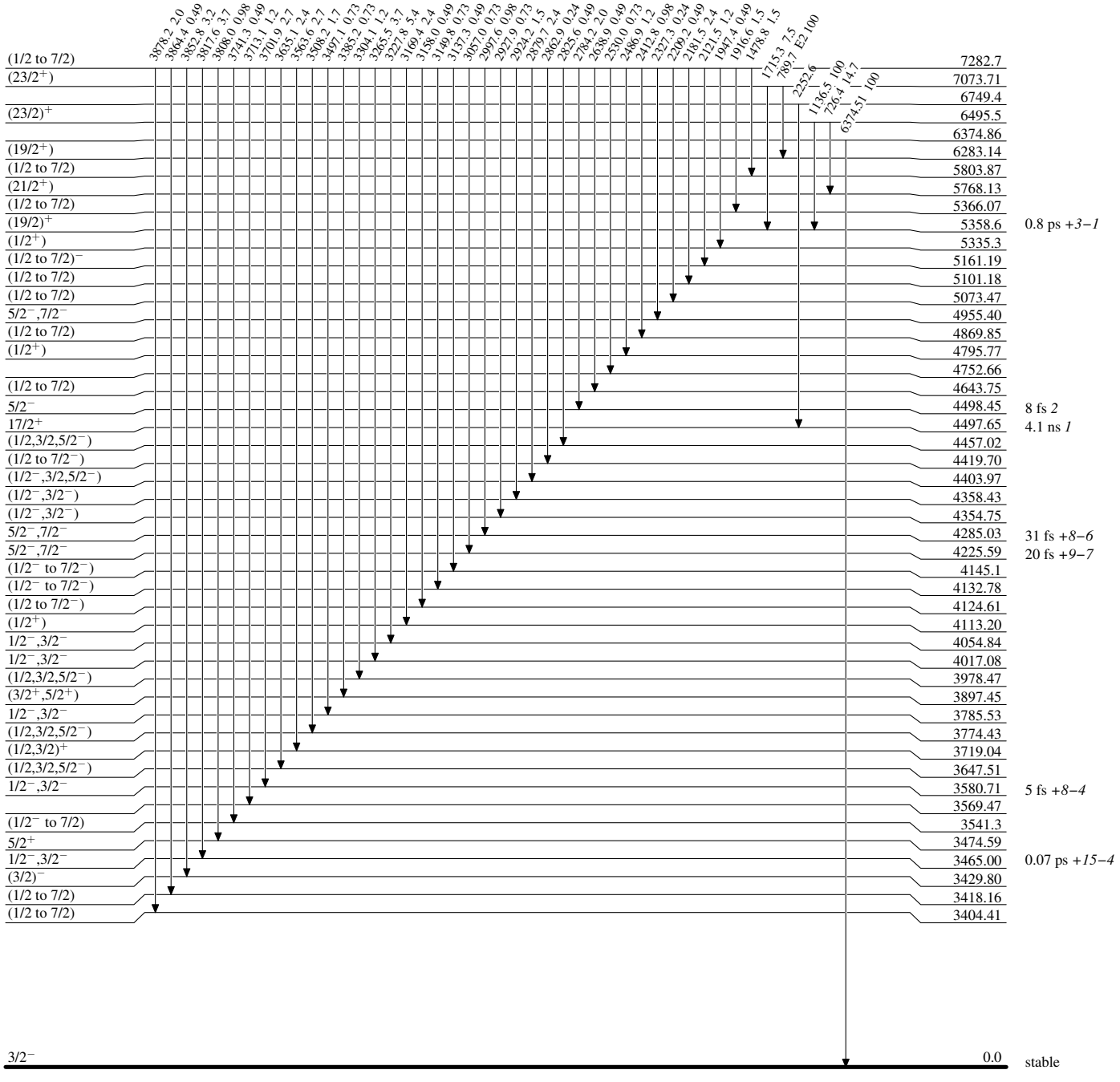


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

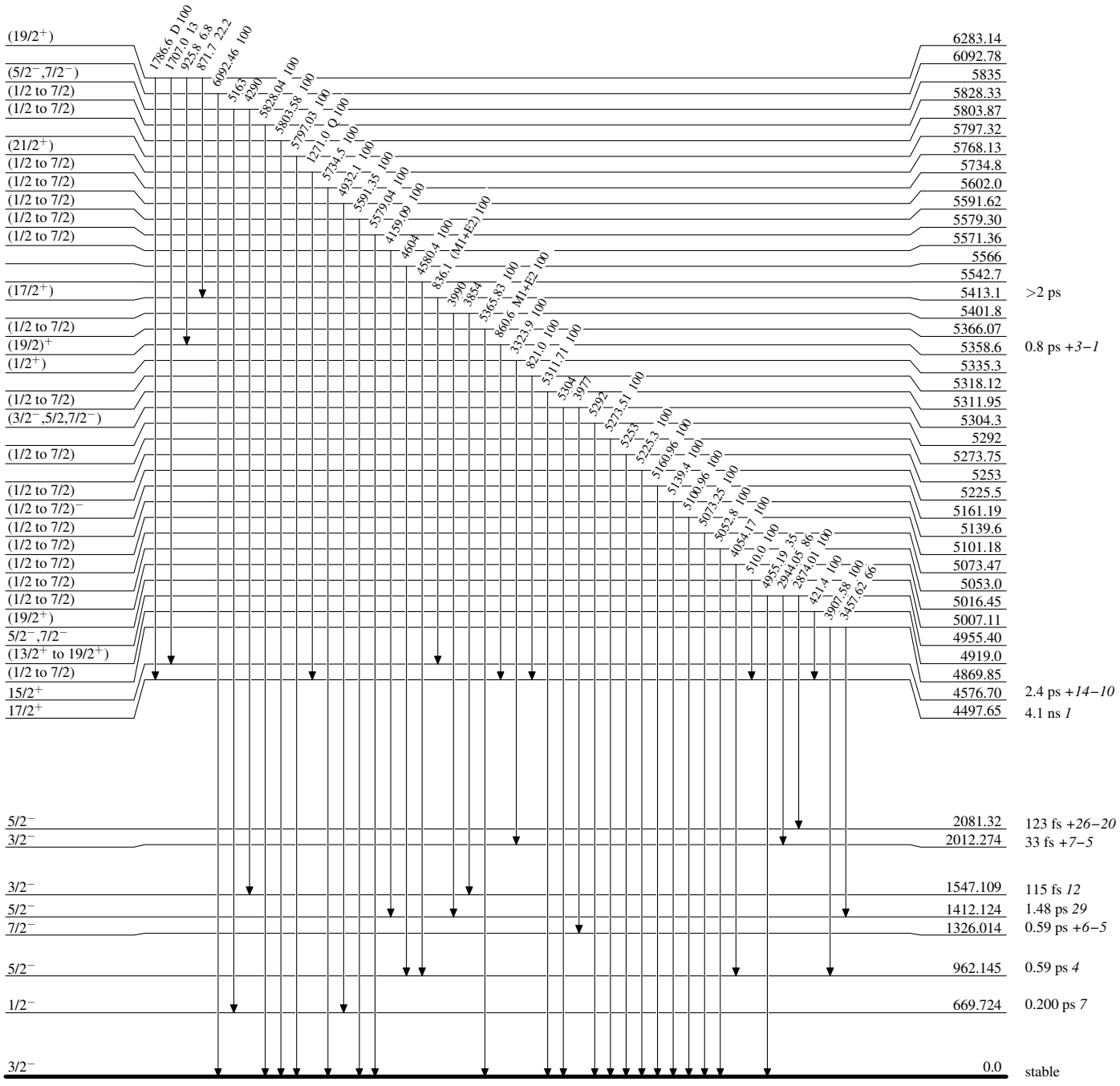


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

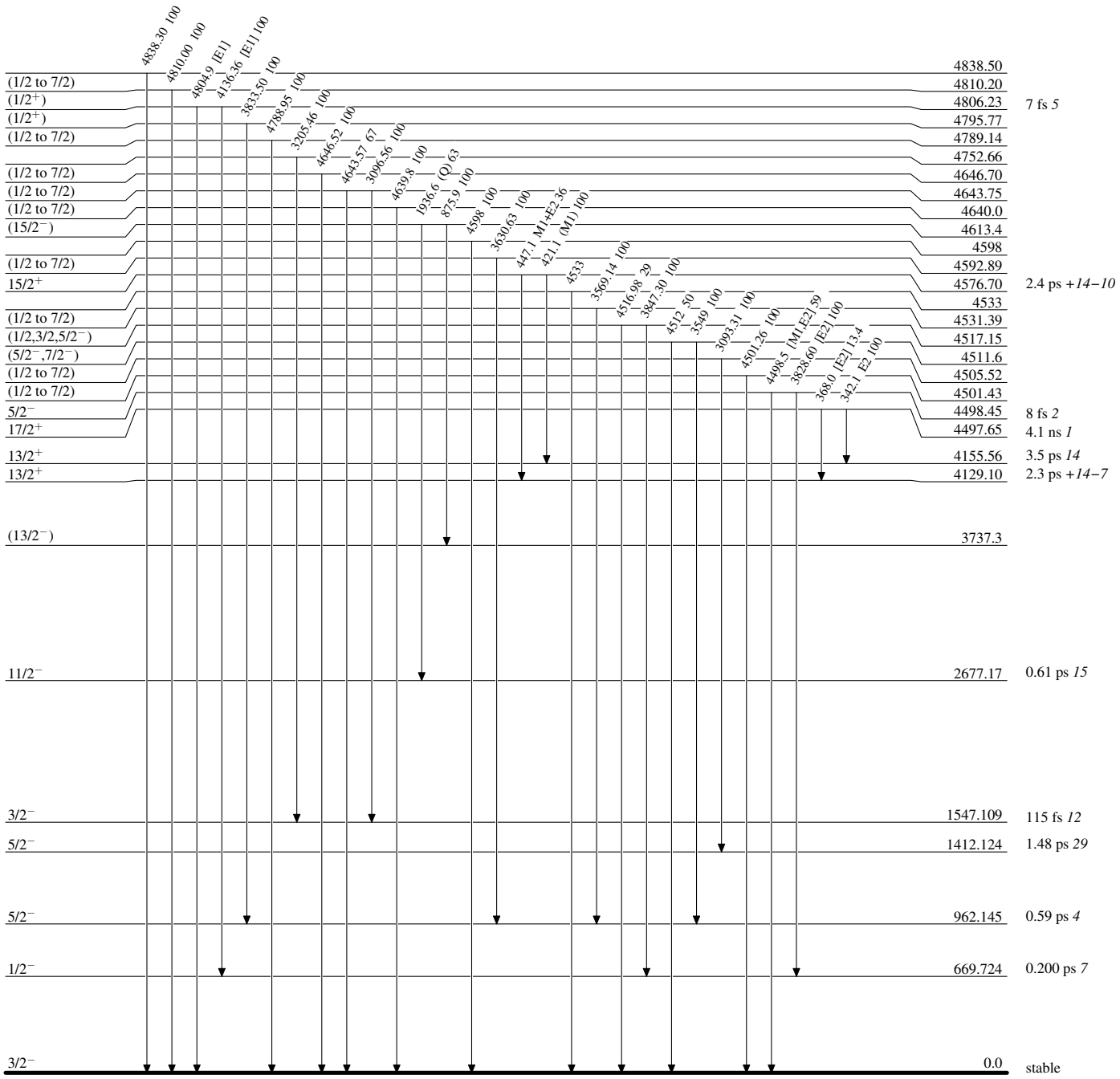


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

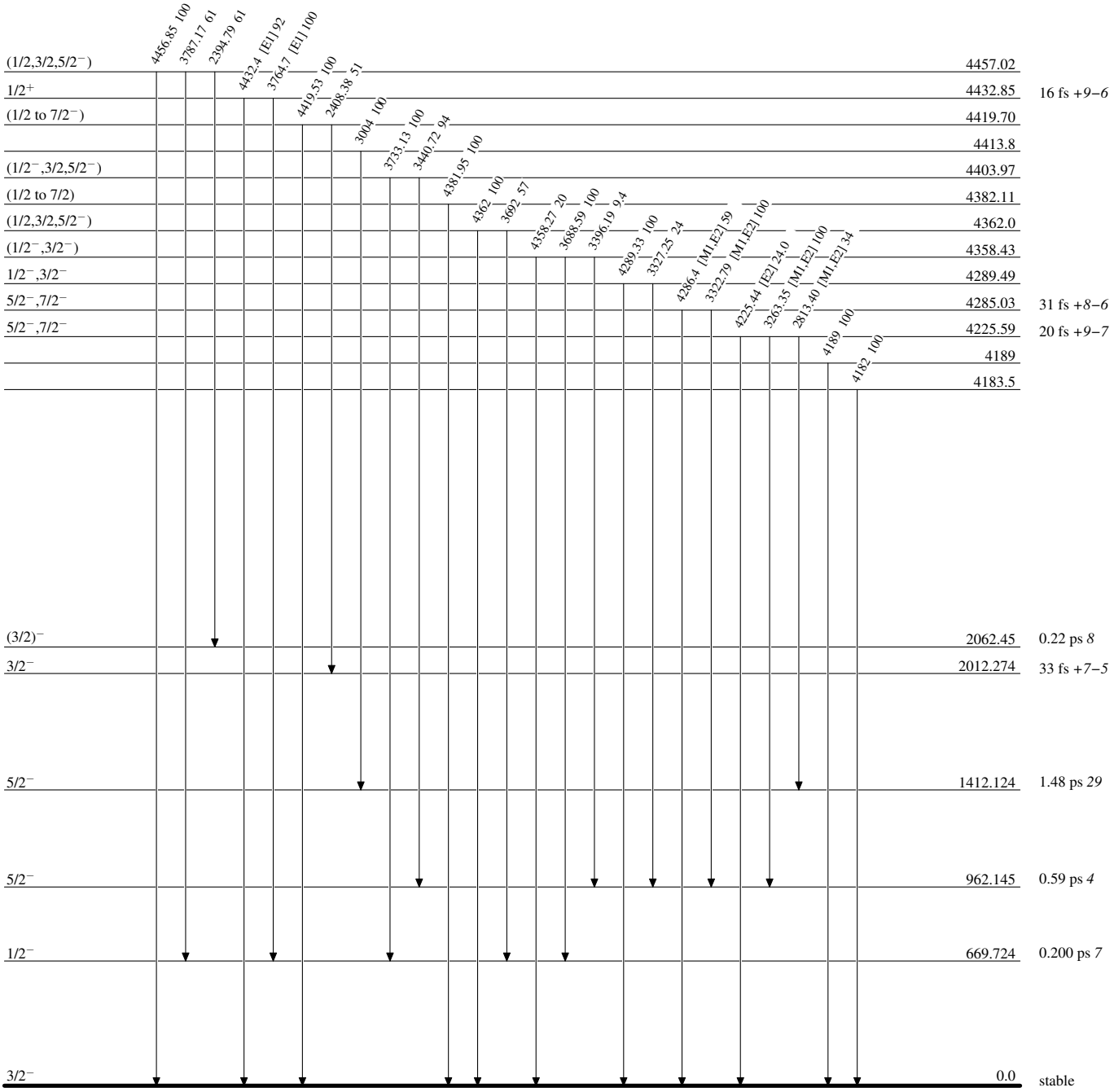


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

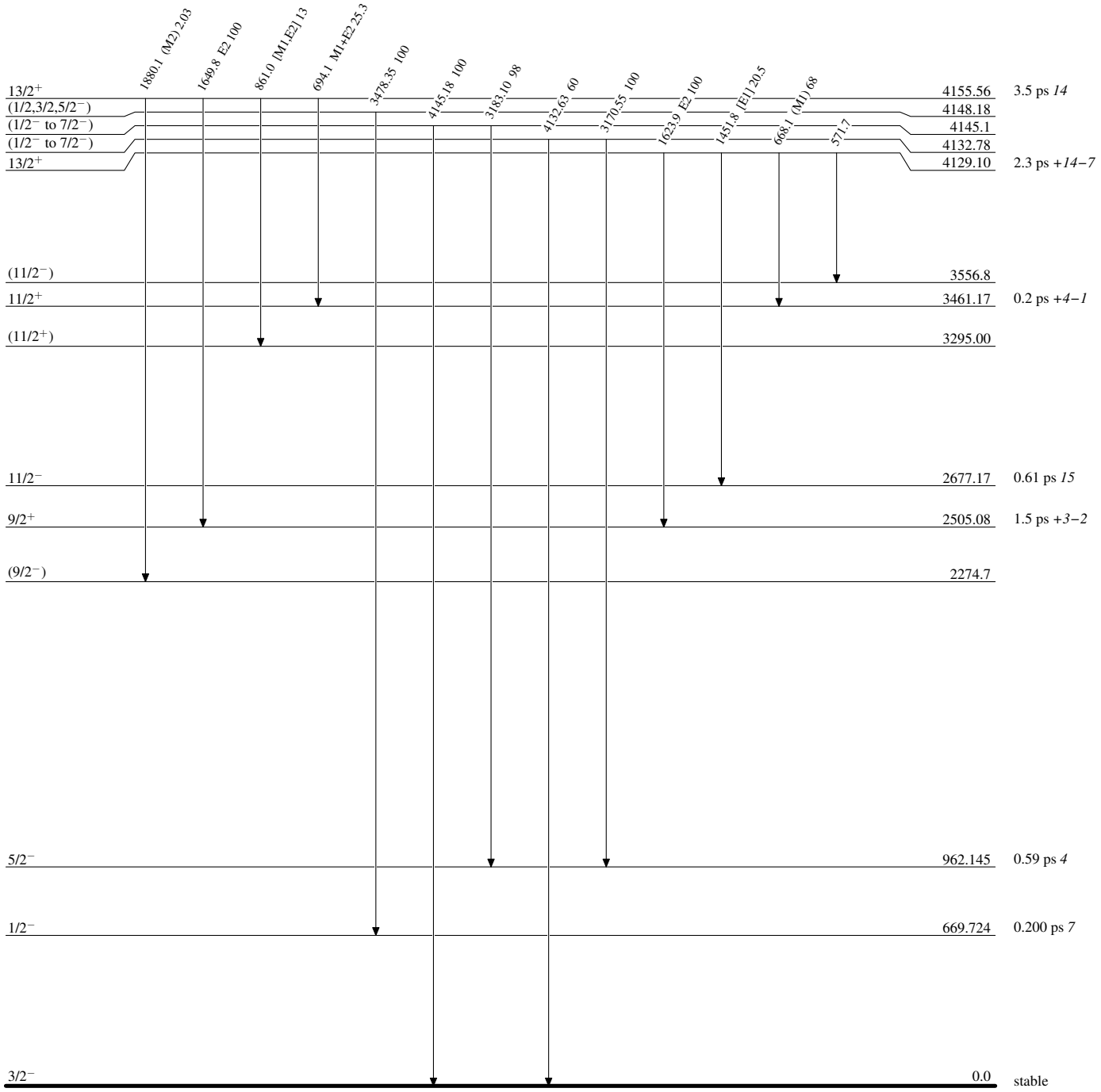


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{63}_{29}Cu_{34}$

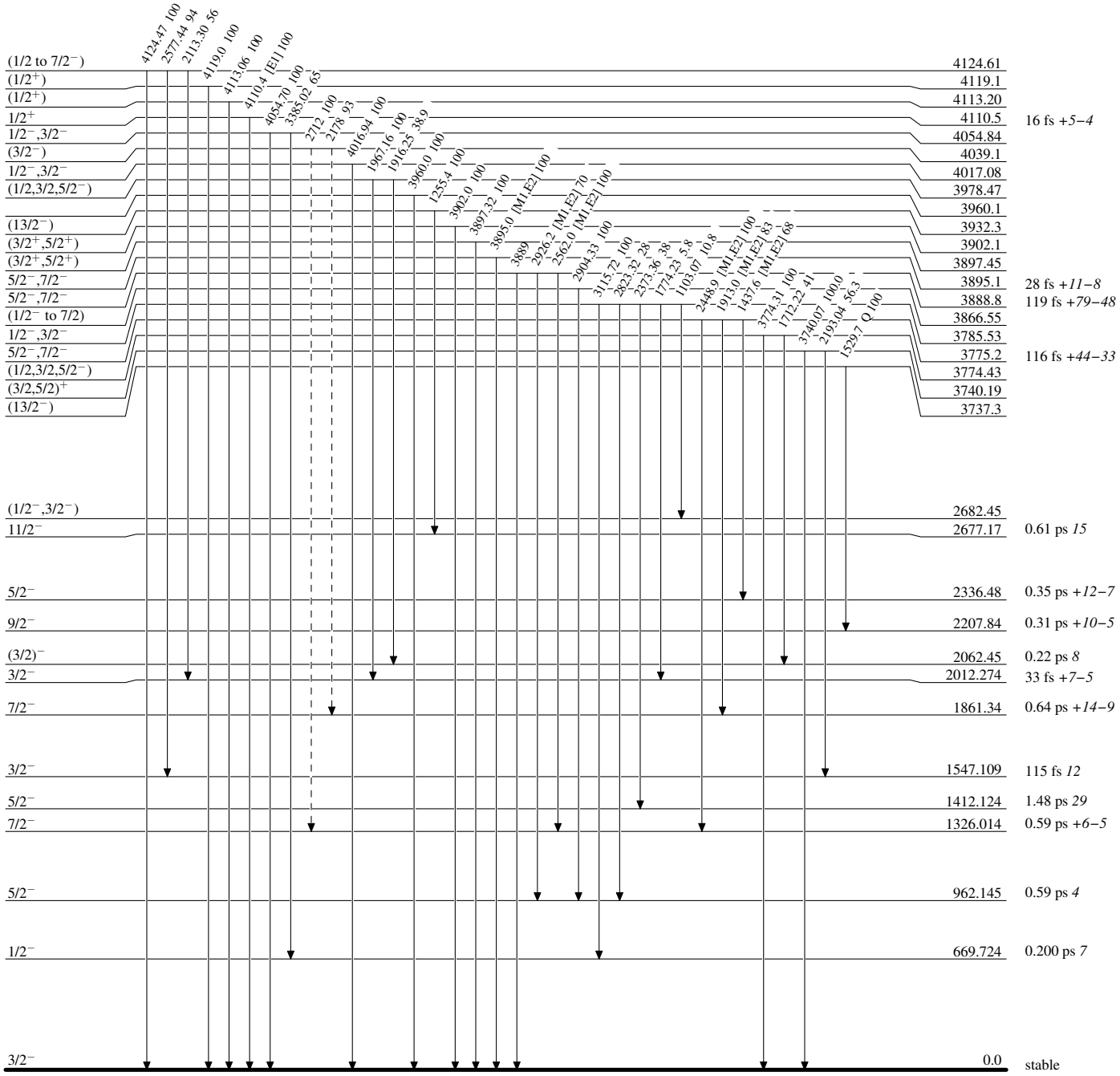
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{63}_{29}Cu_{34}$

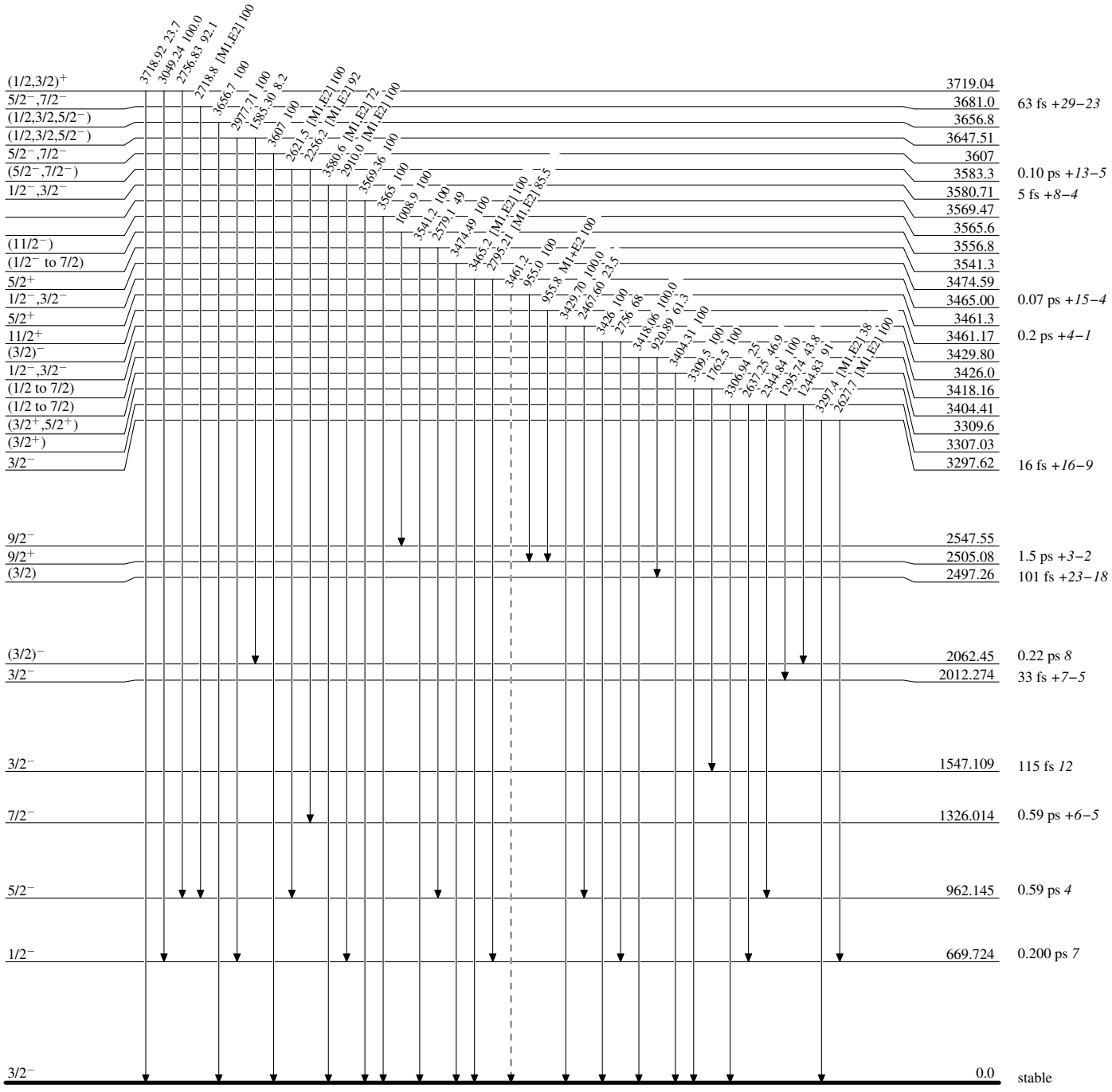
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

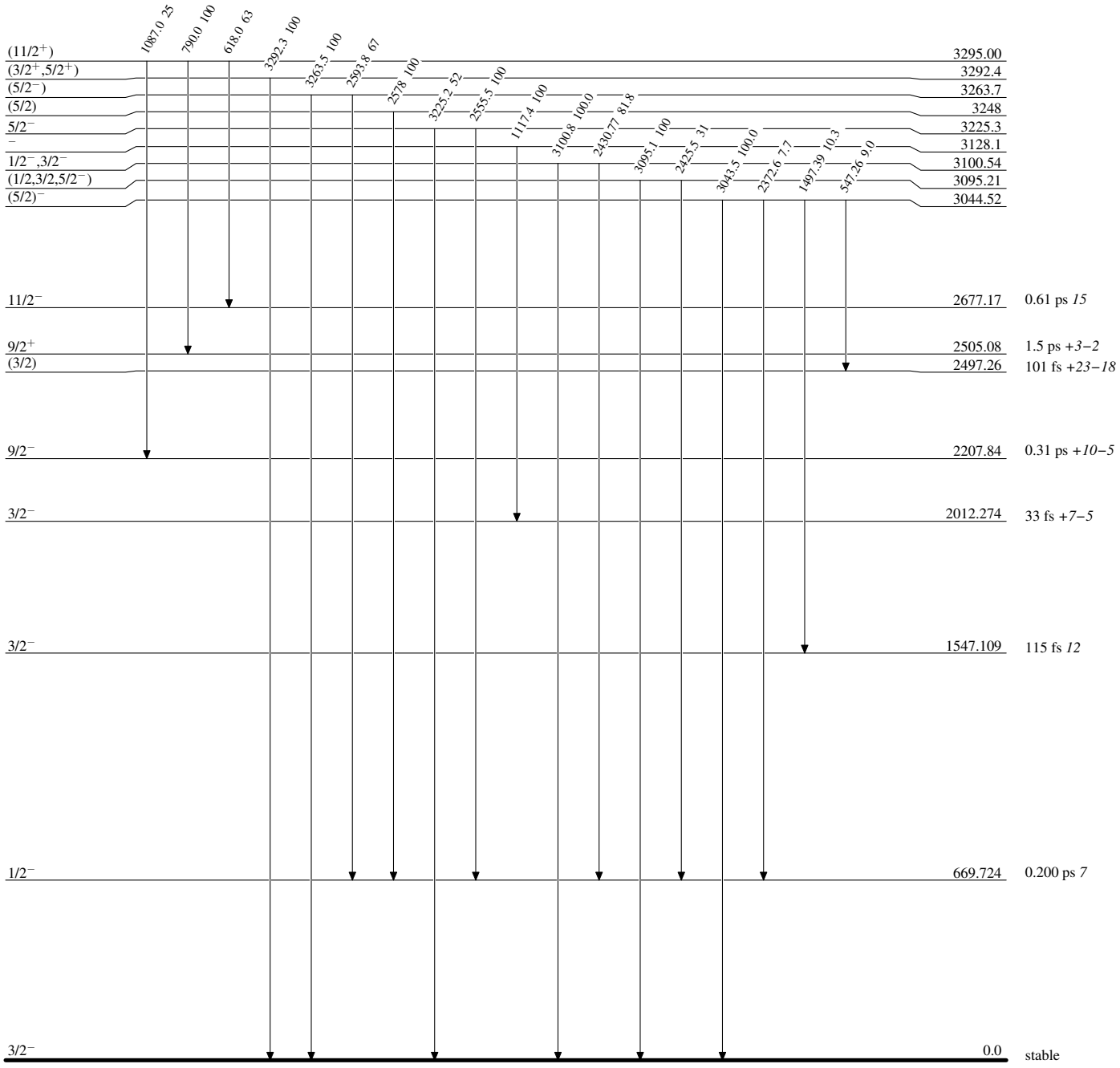


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{63}_{29}Cu_{34}$

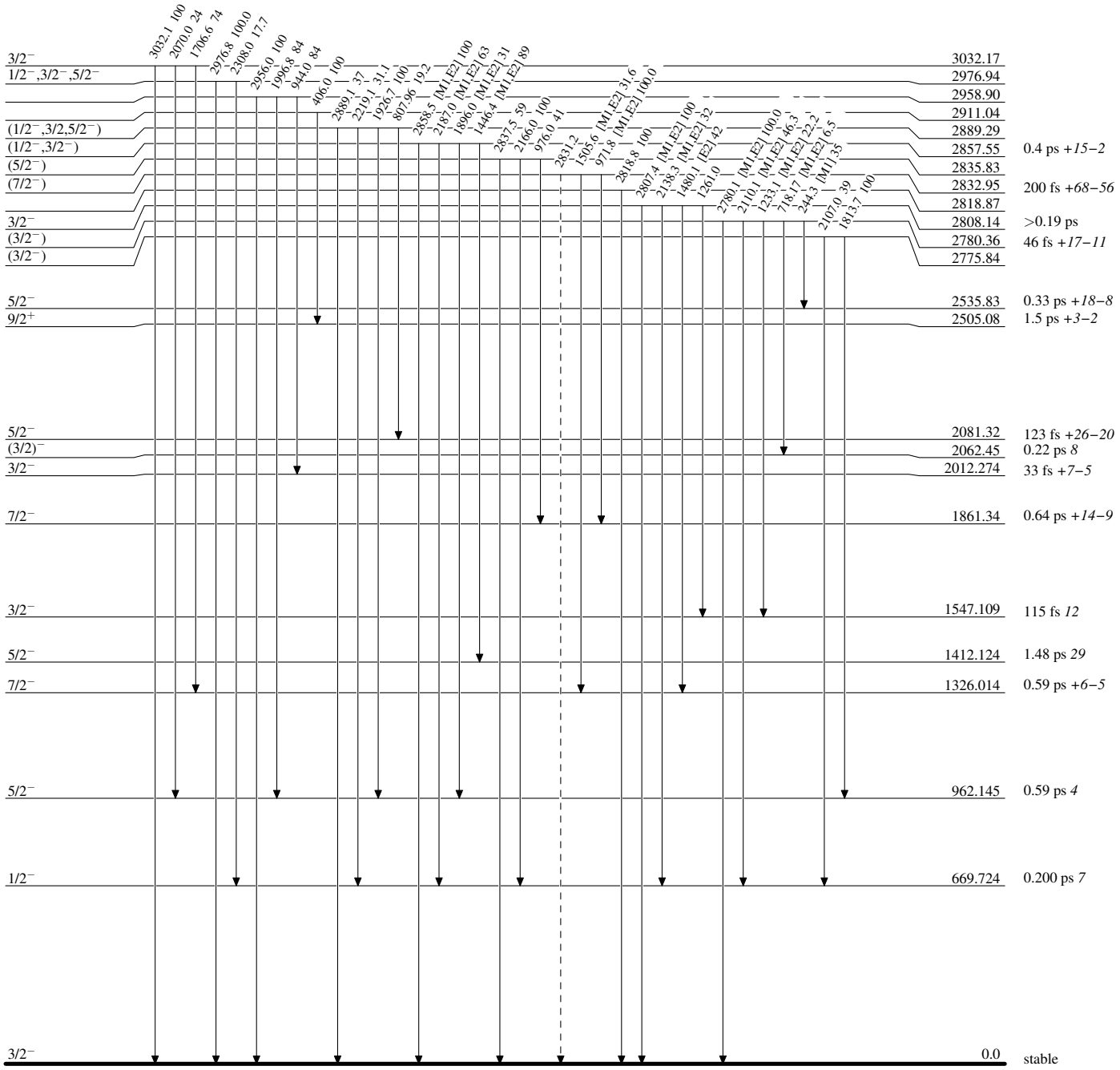
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

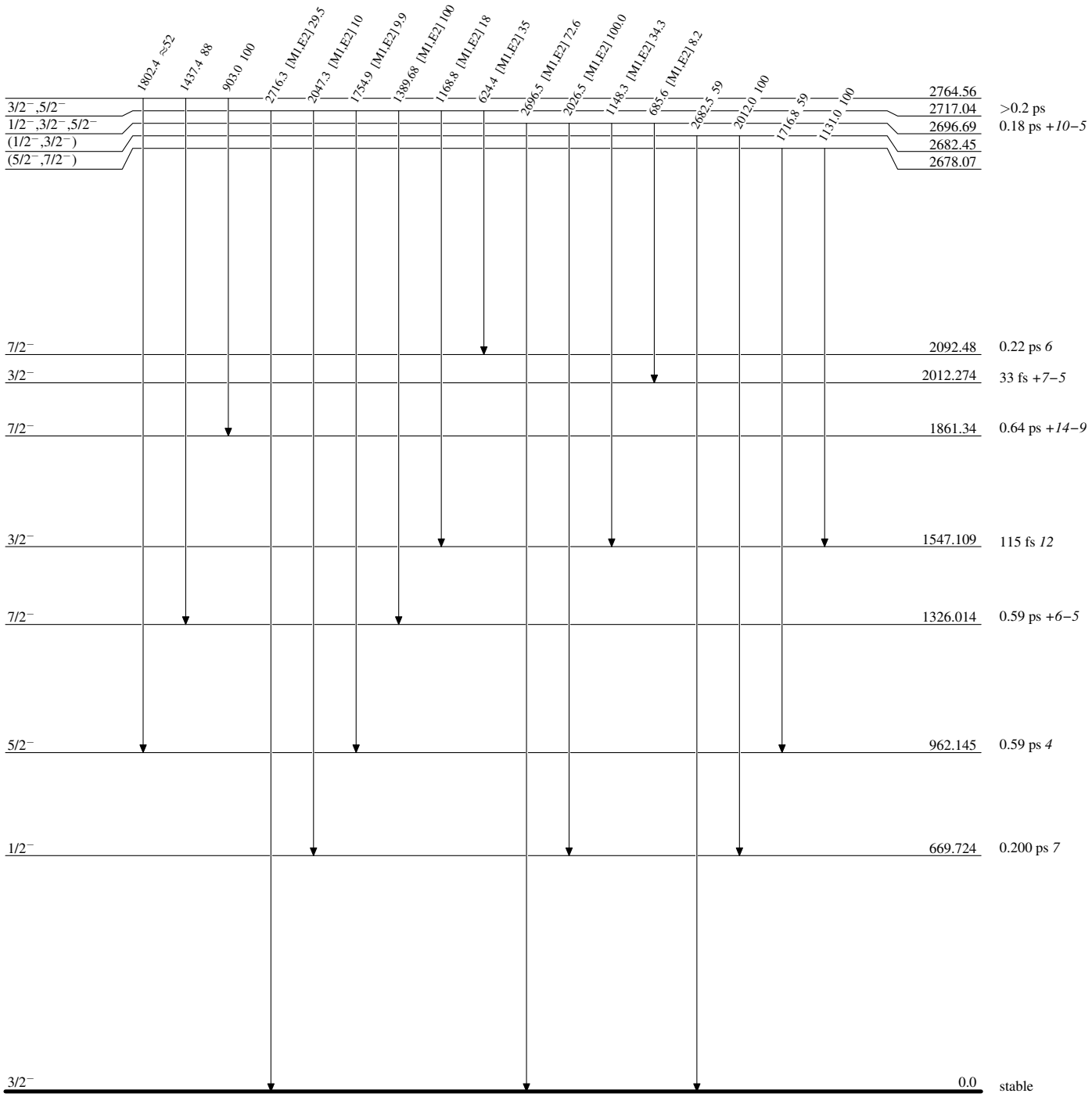


$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



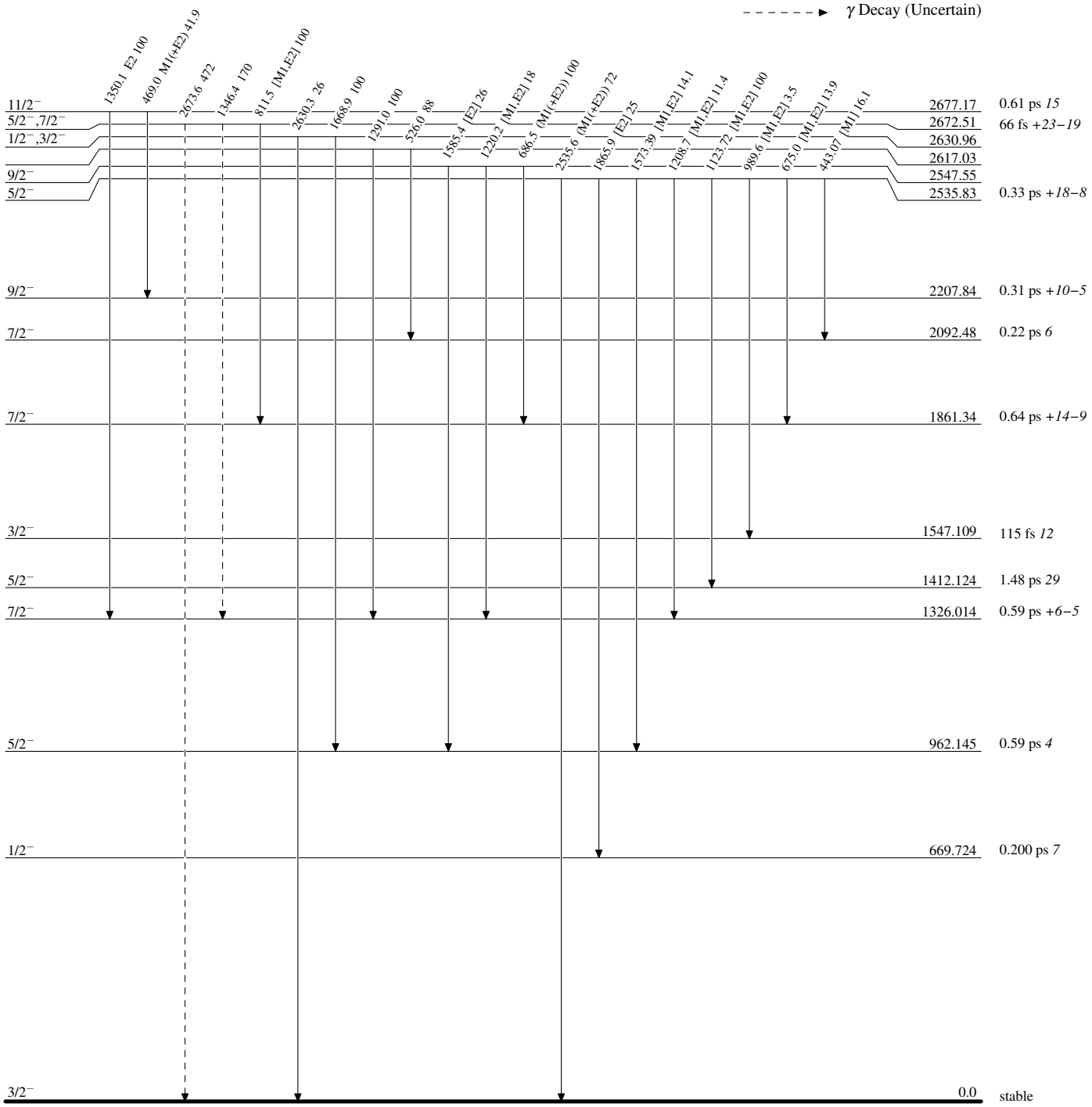
$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{63}_{29}Cu_{34}$

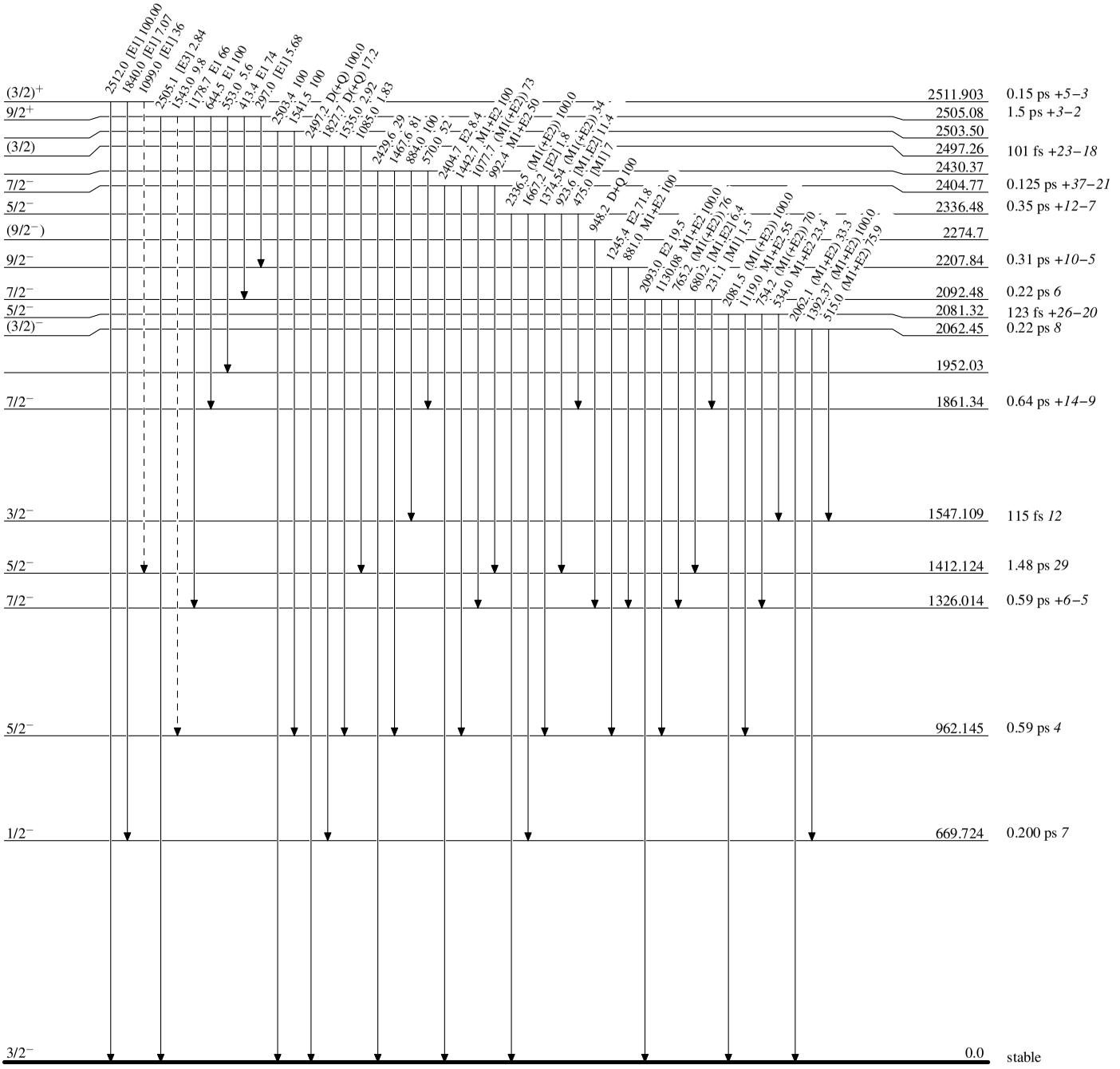
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



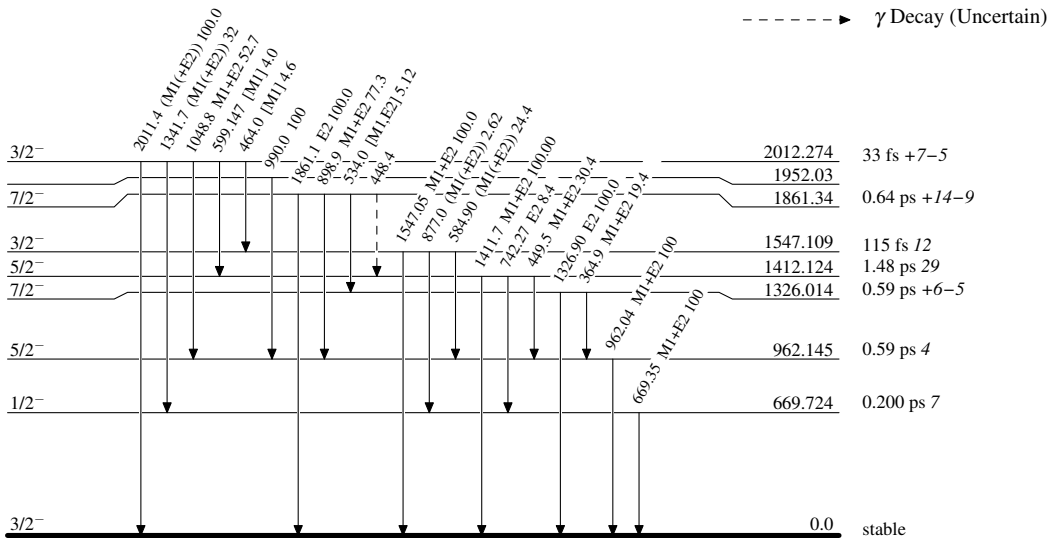
$^{63}_{29}Cu_{34}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{63}_{29}Cu_{34}$