Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 151, 1 (2018)	1-Apr-2018

Q(β^-)=−9142.8 *6*; S(n)=12761.9 *6*; S(p)=3418.6 *4*; Q(α)=−4753.4 *6* 2017Wa10

Other Reactions:

^{58}Ni(^{32}S,xnypγ):

1986Vi06: E(^{32}S)=143 MeV; 99% ^{58}Ni target; measured projectile-like fragments and target-like fragments coincident with discrete γ rays (in plane and normal to plane) using position-sensitive Bragg Curve ionization chamber at 30° and Ge detectors at 90°. Observed 912γ and 1399γ from ^{59}Cu. Measured W(90°)/W(0°)=2.6 *9* for 1399γ and deduced that this is an E2 stretched transition.

^{27}Al(^{32}S,γ):

1989Vi07: E(^{32}S)=100-150 MeV; measured continuum γ spectra; deduced E and Γ for GDR using statistical model.

1995Dr05: E(^{32}S)=90-215 MeV; measured γ production σ(E) and $\gamma(\theta)$ for range of spin (0-47$\hbar$) and excitation energy (55-130 MeV); deduced E and Γ of GDR. Observed broadening of GDR resulting primarily from spin-driven deformation.

^{24}Mg(^{35}Cl,γ):

2004Ma26: Studied the onset of nuclear deformation in ^{59}Cu at high spin from in-plane and out-of-plane correlations of light charged particles and neutrons emissions in the complete fusion reaction.

^{59}Cu Levels

Cross Reference (XREF) Flags

A	^{59}Zn ε decay	E	^{58}Ni(^{3}He,pnγ)	I	^{58}Ni(^{12}C,^{11}B)
B	^{58}Ni(p,γ)	F	^{58}Ni(^{3}He,d), (^{3}He,dp)	J	^{58}Ni(^{16}O,^{15}N),^{58}Ni(^{10}B,^{9}Be)
C	^{58}Ni(p,p),(p,p′γ)	G	^{58}Ni(^{3}He,dγ)	K	^{59}Co(π^+,π^-)
D	^{58}Ni(d,n), (d,np)	H	^{58}Ni(α,t)	L	^{40}Ca(^{28}Si,2αpγ)

E(level)†	Jπ#	$T_{1/2}$ b	XREF	Comments
0.0 d	3/2−	81.5 s *5*	AB DEFGHIJ L	%ε+%β+=100 μ=+1.8910 *9*; Q=−0.20 *2* δ<r²>(^{65}Cu, ^{59}Cu)=−0.635 fm² *9* (stat) *71* (syst). (2016Bi08). Jπ: L=1 in (^{3}He,d), (α,t), (d,n); log *ft*=5.8 to 5/2− 339 level in ^{59}Cu ε decay. $T_{1/2}$: from 1958Bu07 (^{59}Cu ε decay). Others: 1955Li38 (82 s *1*), 1955Yu04 (83 s *1*), 1956Pr12 (83 s *1*), 1939De01 (81 s *2*) − all from (^{59}Cu ε decay). μ: From CLS (2011Vi03, 2014StZZ). Other values: +1.910 *4* (2010Co01), +1.891 *9* (2004Go39), +1.84 *3* (2008St12). Q: From CLS and reevaluation (2013StZZ, 2014StZZ). Other: −0.19 *2* (2011Vi03, 2014StZZ − cls).
491.5 *5*	1/2−	0.58 ps *21*	AB DEFGHIJ L	Jπ: L=1 in (^{3}He,d), (α,t); J=1/2 from $\gamma(\theta)$ in (p,γ).
914.2 i *4*	5/2−	>1.1 ps	AB DEFGHIJ L	Jπ: L=3 in (^{3}He,d), (α,t); log *ft* 5.4 from 3/2− in ^{59}Zn ε decay.
1398.8 d *4*	7/2−	0.40 ps *17*	B DEFGHIJ L	XREF: D(1375). Jπ: L=3 in (^{3}He,d), (α,t); J=7/2 from $\gamma(\theta)$ in (p,γ).
1864.8 e *4*	7/2−		B DE G J L	XREF: D(1837). Jπ: E2 γ to 3/2−; J=7/2 from $\gamma(\theta)$ in (p,γ).
1988.1 *5*	5/2(+)		B DE G	XREF: D(1962). Jπ: J=5/2 from $\gamma(\theta)$ in (p,γ); Q γ from 9/2+ at 6206.

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
2266.5 *5*	3/2$^+$	0.22 ps *10*	B DEFG	XREF: D(2239). Jπ: L(^{3}He,d)=2; J=3/2 from γ(θ) in (p,γ).
2318.5 *11*	1/2$^{(-)}$,5/2$^{(-)}$[@]		B dEf i	XREF: d(2299)f(2323). Jπ: J=1/2,5/2 but not 3/2 from γ(θ) in (p,γ); γ to 1/2$^-$; γ from 5/2$^-$.
2324.1 *5*	3/2$^-$[@]	25 fs *4*	B dEfG iJ	XREF: d(2299)f(2323)J(2300). Jπ: J ≠ 1/2 or 5/2 from γ(θ) in (p,γ); D γ to 3/2$^-$. L=1 in (^{3}He,d).
2369 *10*	3/2$^+$,5/2$^+$		D H	XREF: H(2360). E(level),Jπ: From (α,t), L(α,t)=2.
2390.8[i] *4*	9/2$^-$		DE L	XREF: D(2369). Jπ: stretched E2 γ to 5/2$^-$; γ to 7/2$^-$.
2587.3[d] *4*	11/2$^-$		B DE G J L	XREF: D(2564). Jπ: 1188.4γ Q to 7/2$^-$.
2664.6[f] *5*	(9/2$^-$)		B E L	Jπ: J=5/2,9/2 from γ(θ) in (p,γ); 798.9γ D+Q to 7/2$^-$ and M1+E2 from (11/2$^-$) at 3329.4.
2706.3 *5*	5/2$^-$		B dEf h	XREF: d(2693)f(2710). E(level): Excited level at 2710 *7* with L(^{3}He,d)=3 could correspond to either 2706 or 2715 level, as could L=3 levels at 2690 in (α,t) and at 2693 in (d,n). Jπ: J ≠ 3/2 or 7/2 from γ(θ) in (p,γ); Q γ to 1/2$^-$; D(+Q) γ to 5/2$^-$. L=3 in (^{3}He,d) and (α,t) for 2706 and/or 2715 level(s).
2715.3 *5*	7/2$^-$		B dEf h	XREF: d(2693)f(2710). E(level): a level at 2710 *7* with L(^{3}He,d)=3 could correspond to either 2706 or 2715 level, as could L=3 levels at 2690 in (α,t) and at 2693 in (d,n). Jπ: 7/2 from γ(θ) in (p,γ); Q γ to 3/2$^-$; mixed D+Q γ to 5/2$^-$ and 7/2$^-$. L=3 in (^{3}He,d) and (α,t) for 2706 and/or 2715 level(s).
2928	5/2$^{(-)}$		B D	XREF: D(2913). Jπ: 5/2 from γ(θ) in (p,γ); γ to 1/2$^-$.
2992.0 *14*	3/2,5/2$^-$,7/2$^-$		B E	E(level): From (^{3}He,pnγ). Jπ: γ to 3/2$^-$ and 5/2$^-$ and 5/2$^{(+)}$.
3024.8 *10*	5/2$^{(-)}$		B G	E(level): From (^{3}He,dγ). Jπ: 5/2,7/2 from γ(θ) in (p,γ); γ to 1/2$^-$.
3042.5[j] *4*	9/2$^+$	0.80 ps *35*	B DEFGHIJ L	XREF: D(3023). Jπ: L(^{3}He,d)=4; J=9/2 from γ(θ) in (p,γ).
3114.4 *7*	5/2$^-$	14 fs *8*	B G	Jπ: 5/2 from γ(θ) in (p,γ); M1+E2 γ to 3/2$^-$.
3121.9? *9*			E	
3129.9 *5*	3/2$^-$	6.9 fs *28*	B DEFG	XREF: D(3114). Jπ: L(^{3}He,d)=1; J ≠ 1/2 from γ(θ) in (p,γ).
3309	7/2$^{(-)}$		B d F	XREF: d(3298). Jπ: 7/2 from γ(θ) in (p,γ); γ to 3/2$^-$. L(^{3}He,d)=(4).
3329.4[e] *4*	(11/2$^-$)		E L	Jπ: M1+E2 γ to (9/2$^-$); Q γ to 7/2$^-$ and D+Q to 11/2$^{(-)}$.
3434	5/2		B d h	XREF: d(3427)h(3410). Jπ: from γ(θ) in (p,γ).
3437?	(7/2$^+$,9/2$^+$)		d F	XREF: d(3427). Jπ: L(^{3}He,d)=(4).
3438	(1/2)		B d h	XREF: d(3427)h(3410). Jπ: from γ(θ) in (p,γ).
3447.1[i] *4*	13/2$^-$		E L	Jπ: E2 γ to 9/2$^-$; D+Q γ to 11/2$^{(-)}$.
3550.9 *14*	5/2$^-$	<10 fs	B FGhi	XREF: h(3550). Jπ: 5/2 from γ(θ) in (p,γ); L(^{3}He,d)=3.
3574	5/2,7/2		B hi	XREF: h(3550). Jπ: from γ(θ) in (p,γ).

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
3578			B j	E(level): May be same as the 3580 level, but branching differs significantly.
3580.5 *5*	5/2$^+$	1.7 ps *10*	DEFG j	Jπ: L(^{3}He,d)=2; 5/2 from W(90°)/W(147°) in (^{3}He,dγ); γ to 9/2$^+$.
3615.3 *11*	3/2$^-$	<24 fs	B FG	Jπ: L(^{3}He,d)=1; 3/2,5/2 from γ(θ) in (p,γ).
3654 *10*	1/2$^-$,3/2$^-$		D F	E(level): From (d,n), (d,np). Jπ: L(^{3}He,d)=1.
3699	7/2$^-$		B F H	E(level): From (p,γ). Jπ: L(^{3}He,d)=3; J=7/2 from γ(θ) in (p,γ).
3729	3/2,5/2		B d f	XREF: d(3736)f(3737). Jπ: J=3/2,5/2 from γ(θ) in (p,γ). L(^{3}He,d)=1 for 3729 and/or 3742 level.
3741 *1*	3/2$^-$		B dEfG	XREF: d(3736)f(3737). E(level): From (^{3}He,dγ). Jπ: 3/2 from W(90°)/W(147°) in (^{3}He,dγ); L(d,n)=1. L(^{3}He,d)=1 for 3729 and/or 3742 level.
3758 *1*	5/2$^{(+)}$,7/2,9/2$^{(-)}$		B	Jπ: γ to 5/2$^-$ and 7/2$^-$; γ from 9/2$^+$ at 6905.
3884.7 *10*	3/2$^-$		B d FGh	XREF: d(3893)h(3900). E(level): From (^{3}He,dγ). Fragment of ^{59}Ni(g.s.) IAS. Jπ: L(^{3}He,d)=1; 3/2 from W(90°)/W(147°) in (^{3}He,dγ).
3904.0 *18*	3/2$^-$		B d FGh	XREF: d(3893)h(3900). E(level): From (^{3}He,dγ). Fragment of ^{59}Ni(g.s.) IAS. Jπ: L(^{3}He,d)=1: 3412γ D+Q to 1/2$^-$.
3930	5/2$^+$		B h	XREF: h(3900). Jπ: 5/2,7/2 from γ(θ) in (p,γ); L=2 component of doublet in (α,t).
4000 *2*	(1/2)$^-$		D FG	E(level): From (^{3}He,dγ). Jπ: L(^{3}He,d)=1; J=1/2 favored from angular correlation in (^{3}He,dp).
4051 *1*	1/2$^-$,3/2$^-$		D FG	E(level): From (^{3}He,dγ). Jπ: L(^{3}He,d)=1.
4072	(3/2,5/2,7/2)$^{(-)}$		B H	XREF: H(4090). Jπ: from γ(θ) in (p,γ). Possibly L=3 component of doublet in (α,t).
4100.4[f] *4*	(13/2$^-$)		E L	Jπ: 770.8γ D+Q to (11/2$^-$); 1435.5γ Q to (9/2$^-$).
4108 *1*	3/2$^-$		D FGH	XREF: H(4090). E(level): From (^{3}He,dγ). Jπ: 3/2 from W(90°)/W(147°) in (^{3}He,dγ); L(^{3}He,d)=1.
4154			F	
4183	5/2,9/2$^{(-)}$		B	Jπ: 5/2,9/2 from γ(θ) in (p,γ); γ to 5/2$^{(-)}$.
4207	5/2,7/2$^{(-)}$		B	Jπ: 5/2,7/2 from γ(θ) in (p,γ); γ to 3/2$^-$.
4213 *9*	7/2$^+$,9/2$^+$		F	Jπ: L(^{3}He,d)=4.
4258? *2*			B	
4267 *9*	1/2$^-$,3/2$^-$		D F	E(level): Wt. ave. of data from (d,n), (d,np) and (^{3}He,d), (^{3}He,dp). Jπ: L(^{3}He,d)=1.
4293.9? *21*			E	
4301 *2*	5/2$^{(-)}$		B d fGh	XREF: d(4308)h(4300). E(level): From (^{3}He,dγ). Possible ^{59}Ni(5/2$^-$, 339 level) analogue fragment, but E is high cf. systematics. Jπ: not 7/2, from W(90°)/W(147°) in (^{3}He,dγ); 5/2,7/2 from γ(θ) in (p,γ). π=− if analogue state.
4307	5/2$^{(-)}$		B d f h	XREF: d(4308)h(4300).

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
				Jπ: J=5/2 from γ(θ) in (p,γ). L(^{3}He,d)=3 for 4301 and/or 4307 level(s). π=− if analogue state.
				E(level): Possible fragment of ^{59}Ni(5/2−, 339 level) analogue, but E is high cf. systematics.
4349 *1*	(1/2)−		AB D FG	XREF: D(4358)F(4357).
				E(level): From (^{3}He,dγ). Possible 1/2− ^{59}Ni(465 level) analogue.
				Jπ: (1/2) from d-p angular correlation in (^{3}He,dp); L(^{3}He,d)=1.
4411.3? *20*			B	
4441	7/2+		B F	XREF: F(4454).
				Jπ: L(^{3}He,d)=4; J=7/2 from γ(θ) in (p,γ).
4465	5/2(+),7/2,9/2(−)		B	Jπ: γ to 5/2−; γ from 9/2+ at 6905.
4500 *5*	(1/2)−	7.8 fs *7*	AB F	E(level): From ^{59}Zn ε decay.
				Jπ: L(^{3}He,d)=1; J=(1/2) from angular correlation in (^{3}He,dp).
				$T_{1/2}$: from (p,γ).
4527.9[j] *4*	(13/2+)		E L	Jπ: Q γ to 9/2+.
4530 *1*	(7/2)+		B F I	Additional information 1.
				E(level): From (p,γ).
				Jπ: L(^{3}He,d)=4; γ to 5/2−.
4618 *2*			B	
4699 *2*	(3/2)		aB	XREF: a(4703).
				Jπ: 3/2 from branching statistics in (p,γ).
4710.7 *24*	(1/2)−		aB F	XREF: a(4703).
				E(level): From (p,γ).
				Jπ: L(^{3}He,d)=1; J=(1/2) from d-p angular correlation in (^{3}He,dp).
4774 *3*	3/2−,5/2−	3.5 fs *3*	AB d F i	XREF: d(4790)F(4780).
				E(level): Unweighted ave. of data from (p,γ), ^{59}Zn ε decay, and (^{3}He,d), (^{3}He,dp).
				$T_{1/2}$: from (p,γ).
				Jπ: L(^{3}He,d)=1.
				E(level): Fragment of 3/2− ^{59}Ni(878 level) analogue.
4810	7/2+,9/2+		D	E(level),Jπ: L(d,n)=4 for component of 4810 doublet.
4818 *5*	3/2−		AB d F i	XREF: d(4790)F(4830).
				E(level): From ^{59}Zn ε decay.
				Jπ: 3/2 from γ(θ) in (p,γ); L(^{3}He,d)=1.
				Analogue of 3/2− ^{59}Ni(878 level).
4904.0[e] *4*	(15/2−)		E L	Jπ: D+Q γ to (13/2)−; Q γ to (11/2−).
4914.6 *20*	5/2(+),7/2,9/2(−)		B	Jπ: γ to 5/2−; γ from 9/2+ at 6905.
4932.3 *20*	7/2+,9/2+		B F	E(level): From (p,γ).
				Jπ: L(^{3}He,d)=4.
4973.6 *20*	3/2+,5/2+		B F	E(level): From (p,γ).
				Jπ: L(^{3}He,d)=2.
5043.3 *20*			B i	
5053.2 *20*	(5/2)−		B F i	E(level): From (p,γ). Probable analogue of 5/2− ^{59}Ni(1189 level).
				Jπ: 3/2,5/2 from branching statistics in (p,γ); L(^{3}He,d)=3.
5105.3 *24*	(1/2−,3/2,5/2−)		B F i	E(level): From (p,γ).
				Jπ: γ to 1/2− and 5/2−.
5220.3 *20*	9/2	10.5 fs *10*	B	E(level),$T_{1/2}$: From (p,γ).
				Jπ: 9/2 from γ(θ) in (p,γ).
5230.6 *7*	1/2−		ABCD F	XREF: D(5240).
				E(level): From (p,γ). Analogue of 1/2− ^{59}Ni(1301 level).
				Jπ: L=1 in (^{3}He,d); J=1/2 from (d,np) correlation.
5255.0? *10*			B	
5264 *4*	3/2−		AB F i	XREF: F(5283).
				E(level): From (p,γ).
				Jπ: 3/2 from γ(θ) in (p,γ); ε decay from 3/2− ^{59}Zn is allowed

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
			(log *ft*=5.5 *1*); L(^{3}He,d)=1.
5306 *4*	(1/2)$^-$	AB D F i	XREF: D(5330)F(5316). E(level): From (p,γ). Jπ: L(^{3}He,d)=1; (1/2) from d-p angular correlation in (^{3}He,dp).
5427.0[j] *4*	(17/2$^+$)	E L	Jπ: Q γ to (13/2$^+$), band assignment.
5431 *4*		B	
5442 *4*	(3/2)$^+$	B F	E(level): From (p,γ). Jπ: L(^{3}He,d)=2; γ to 1/2$^-$.
5473 *4*		aB d	XREF: a(5477)d(5490). E(level): From (p,γ). Jπ: γ to 3/2$^-$.
5482 *4*	(5/2$^-$)	aB d F	XREF: a(5477)d(5490). E(level): From (p,γ). Jπ: L(^{3}He,d)=3; γ to 1/2$^-$ and 3/2$^+$; however, γ to 9/2$^+$ also.
5521 *4*	3/2$^-$,5/2	B	E(level): Fragment of 5/2$^-$ ^{59}Ni(1680 level) analogue. Jπ: D(+Q) γ to 3/2$^-$, γ to 5/2$^-$.
5542 *4*	1/2$^-$,3/2$^-$,5/2$^-$	AB	E(level): From (p,γ). Jπ: log *ft*<5.9 from 3/2$^-$ in ^{59}Zn ε decay.
5550 *4*	(3/2,5/2)	B	Jπ: From (p,γ). D+Q γ to 7/2$^-$ and to 3/2$^-$. Fragment of 5/2$^-$ ^{59}Ni(1680 level) analogue.
5584 *4*		B	
5589 *4*		B	
5597 *3*	(1/2$^+$)[&]	C	
5602 *4*	(3/2)	B	Jπ: From (p,γ) – probable analogue of 3/2$^-$ ^{59}Ni(1735 level).
5608 *4*	(1/2)$^-$	B D F	XREF: D(5620)F(5612). Jπ: L(d,n)=1 and J=1/2 from n-p angular correlation in (d,np) for E=5620 *30*.
5620 *4*	7/2$^{(-)}$	B d	XREF: d(5630). Jπ: 7/2 from γ(θ) in (p,γ); D γ to 9/2$^+$, γ to 3/2$^-$.
5642 *4*	(3/2)$^-$	AB d	XREF: d(5630). E(level): From (p,γ). Jπ: log *ft*<5.9 from 3/2$^-$ in ^{59}Zn ε decay; D+Q γ to 1/2$^-$, γ to 7/2$^-$; probable 3/2$^-$ ^{59}Ni(1735 level) analogue.
5658 *4*	5/2$^-$	AB d F	XREF: d(5630). E(level): From (p,γ). Jπ: 5/2 from γ(θ) in (p,γ); L(^{3}He,d)=3.
5694 *4*		B d	XREF: d(5710).
5712 *4*	5/2$^-$	AB d f	XREF: d(5710)f(5722). E(level): From (p,γ). Jπ: 5/2 from γ(θ) in (p,γ); ε decay from 3/2$^-$ ^{59}Zn is allowed (log *ft*=5.7 *2*). L(^{3}He,d)=3 for 5712 level and/or 5719 level.
5721.8 *3*	3/2,5/2$^{(-)}$	B d f	XREF: d(5710)f(5722). Additional information 2. E(level): From (^{3}He,pnγ). Jπ: 3/2,5/2 from γ(θ) in (p,γ); γ to 1/2$^-$. L(^{3}He,d)=3 for 5712 level and/or 5719 level.
5722.2[f] *4*	(17/2$^-$)	E L	Jπ: Q γ to (13/2$^-$) and D+Q γ to (15/2$^-$).
5777.5 *16*		B	
5801 *4*		B	
5822 *4*		B	
5833 *4*		B	
5840 *3*	(5/2$^+$)[&]	CD	XREF: D(5850).
5846 *3*	(1/2$^-$)[&]	C	E(level): from (p,p),(p,p′γ).
5851 *4*	5/2$^-$	B F	E(level): From (p,γ). Jπ: 5/2 from (p,γ); L(^{3}He,d)=3.

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
5881 *4*	3/2⁻,5/2⁻		AB	XREF: A(5869). Jπ: 3/2,5/2 from γ(θ) in (p,γ); log *ft*=5.3 *2* from 3/2⁻ in ^{59}Zn ε decay.
5897 *4*	7/2(⁻)		B	E(level): From (p,γ). Analogue of 7/2⁻ ^{59}Ni(1948 level). Jπ: 7/2 from γ(θ) in (p,γ); proposed analogue has π=−.
5914 *4*	5/2		B d	XREF: d(5930). Jπ: γ(θ) in (p,γ).
5923 *9*	1/2⁻,3/2⁻		A d F	XREF: d(5930). E(level): From (^{3}He,d), (^{3}He,dp). Jπ: L(^{3}He,d)=1.
5928 *4*	5/2		B d	XREF: d(5930). Jπ: γ(θ) in (p,γ).
5941 *4*	3/2,5/2		B d	XREF: d(5930). Jπ: γ(θ) in (p,γ).
5950 *9*	(9/2)⁺		D F	XREF: D(5900). Jπ: L(^{3}He,d)=4; (9/2) from d-p(θ) in (^{3}He,dp).
5957 *4*			B	
5968 *4*			B	Jπ: 5/2 from γ(θ) in (p,γ) for 5968 level or 5971 level or possibly a mixture of the two.
5971 *4*			B i	Jπ: 5/2 from γ(θ) in (p,γ) for 5968 level or 5971 level or possibly a mixture of the two.
6033 *4*	1/2⁻,3/2⁻		B d F i	XREF: d(6030)F(6049). Jπ: L(^{3}He,d)=1.
6039 *4*	(3/2⁺)		BCd F i	XREF: C(6033)d(6030)F(6049). Jπ: 3/2⁺ from (p,p),(p,p′γ); 3/2 from γ(θ) in (p,γ).
6049.8[h] *4*	(17/2⁻)		L	Jπ: Q γ to (13/2⁻), D+Q γ to (15/2⁻), band assignment.
6076 *4*	3/2		B	Jπ: 3/2 from γ(θ) in (p,γ).
6087 *3*	(1/2⁺)		C	E(level),Jπ: from (p,p),(p,p′γ). E≈8 keV low; level differs from 6091 level only if J≠3/2.
6091 *4*	(3/2)		B	Jπ: 3/2 from γ(θ) in (p,γ).
6104 *3*	(5/2⁺)[&]		CD	XREF: D(6120). E(level),Jπ: from (p,p),(p,p′γ). Also L(d,n)=2.
6125 *4*	3/2⁻,5/2⁻		B F	XREF: F(6118). Jπ: 3/2,5/2 from (p,γ); L(^{3}He,d)=1.
6174.9[l] *4*	(15/2⁺)		L	Jπ: D γ to (13/2⁻), band assignment.
6197 *4*	(3/2)		Bc	XREF: c(6191). E(level): From (p,γ). Possible fragment of ^{59}Ni(2415 level) if π=−. Jπ: (3/2) from (p,γ); γ to 7/2(⁻). Jπ=(3/2⁺,5/2⁺) in (p,p),(p,p′γ) for 6197 and/or 6201 level(s).
6201 *4*	3/2,5/2		Bc	XREF: c(6191). E(level): From (p,γ). Possible fragment of 3/2⁻ ^{59}Ni(2415 level) analogue if π=−. Jπ: From (p,γ); γ to 1/2⁻. Jπ=(3/2⁺,5/2⁺) from (p,p),(p,p′γ) for 6197 and/or 6201 level(s).
6206 *4*	9/2⁺		B D F	XREF: D(6240). E(level): From (p,γ). Jπ: 9/2 from (p,γ); L=4 in (^{3}He,d) and (d,n).
6210 *30*	5/2⁻,7/2⁻		D	Jπ: L(d,n)=3.
6230 *3*	(1/2⁻)[&]		C	E(level): from (p,p),(p,p′γ).
6238 *4*	3/2⁻		B F	E(level): From (p,γ). Possible 3/2⁻ ^{59}Ni(2415 level) analogue fragment. Jπ: 3/2,5/2 from γ(θ) in (p,γ); L(^{3}He,d)=1.
6297 *3*	(1/2⁻)[&]		C	E(level): from (p,p),(p,p′γ).
6300 *4*	(3/2⁻,5/2⁻)		B	Jπ: γ to 1/2⁻ and 7/2⁻. 3/2,5/2 in (p,γ).
6310 *9*	(9/2)⁺		F	Jπ: L(^{3}He,d)=4; (9/2) from d-p angular correlation in (^{3}He,dp).
6323.9 *24*	(5/2)	20 eV *10*	BCd	XREF: C(6325)d(6330).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
				Jπ: 5/2 in (p,γ), γ to 1/2⁻. Inconsistent with Jπ=5/2⁺ in (p,p),(p,p′γ) from R-matrix resonance parameters for σ(E(p),θ). $T_{1/2}$: see comment on Jπ.
6326 *4*	(3/2⁻)		B	Jπ: γ to 7/2⁻ and 1/2⁻, 3/2 in (p,γ).
6336 *4*	(5/2⁺)[&]	20 eV *10*	BCd	XREF: C(6328)d(6330).
6344.2 *12*	(3/2⁻,5/2⁻)		B	Jπ: 3/2,5/2 in (p,γ); γ to 1/2⁻ and 7/2⁻.
6365.3 *30*	(3/2⁺)[&]	60 eV *12*	C	
6365.5 *9*	3/2⁻		B F	XREF: F(6372). E(level): from (p,γ). Jπ: L(^{3}He,d)=1. D+Q γ 1/2⁻ and 5/2⁻.
6381 *4*			B d	XREF: d(6410).
6396 *4*			B d	XREF: d(6410).
6404 *4*			B d	XREF: d(6410).
6410 *4*			B d	XREF: d(6410).
6419 *4*	3/2(⁻)	90 eV *18*	BCd F	XREF: d(6410). Jπ: 3/2 from γ(θ) in (p,γ); D(+Q) to 1/2⁻ and 5/2⁻.
6444 *4*			B	
6451 *4*			B f	Jπ: γ to 3/2⁻. L(^{3}He,d)=3 for 6451 and/or 6457 level(s).
6457 *4*	5/2		B f	Jπ: 5/2 from γ(θ) in (p,γ). L(^{3}He,d)=3 for 6451 and/or 6457 level(s).
6461 *4*	3/2(⁻)		B	Jπ: 3/2 from γ(θ) in (p,γ); D+Q γ to 1/2⁻ and 5/2⁻.
6470 *4*	3/2,5/2(⁻)		B	Jπ: 3/2,5/2 from γ(θ) in (p,γ); γ to 1/2⁻.
6481 *4*			B	
6487 *4*			B	
6493 *4*	7/2(⁻)		B	Analogue of 7/2⁻ ^{59}Ni(2627 level). Jπ: 7/2 from γ(θ) in (p,γ); γ to 3/2⁻.
6502.2 *30*			BC	E(level): From (p,p),(p,p′γ).
6511.8 *30*		60 eV *12*	BC	E(level): From (p,p),(p,p′γ) – same excitation energy for two levels with 1/2⁻ and 3/2⁻ assignments. 1/2⁻ state present both in primary and secondary – however total widths have significant difference.
6515.7 *31*	(1/2⁺)[&]	5.5 keV *5*	C	
6515.9 *31*	(3/2⁺)[&]	80 eV *16*	C	
6519 *6*	5/2⁻,7/2⁻		B F	Jπ: L(^{3}He,d)=3. E(level): Possible 7/2⁻ ^{59}Ni(2627 level) analogue.
6530.2 *25*	(3/2⁻)[&]		BC I	E(level): From (p,p),(p,p′γ).
6559 *4*			B d i	XREF: d(6540).
6575.3 *30*	(3/2,1/2)⁻[&]	90 eV	BC	E(level): From (p,p),(p,p′γ).
6598 *9*	5/2⁻,7/2⁻		F i	Jπ: L(^{3}He,d)=3. Possible 1/2,3/2,5/2,5/2 ^{59}Ni(2681 level) analogue.
6604.1 *30*	(3/2⁻,1/2⁻)[&]	100 eV *10*	C	
6610.6[e] *4*	(19/2⁻)		L	Jπ: 888.1γ D+Q to (17/2⁻), 1707.4γ Q to (15/2⁻), band assignment.
6625.5 *20*	3/2(⁺)	45 eV *5*	BCd i	XREF: B(6627)d(6620). E(level): From (p,p),(p,p′γ). Jπ: 3/2 from γ(θ) in (p,γ); π=+ from (p,p),(p,p′γ).
6632 *9*	7/2⁺,9/2⁺		B d F	XREF: d(6540). E(level): From (p,p),(p,p′γ). Jπ: L(^{3}He,d)=4.
6645.5 *3*	(3/2⁻)[&]	60 eV *12*	BCd	XREF: d(6620). E(level): From (p,p),(p,p′γ).
6662 *4*			B	
6669 *9*	7/2⁺,9/2⁺		B F	E(level): From (p,p),(p,p′γ). Jπ: L(^{3}He,d)=4.
6690.4[k] *4*	(17/2⁺)		L	Jπ: 515.4γ D+Q to (15/2⁺) and band assignment.

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)†	Jπ#	$T_{1/2}$b	XREF	Comments
6692 *4*			B	
6707.8 *20*	$(1/2^-)$&	80 eV *8*	C	
6710 *4*	$3/2^{(-)}$		B	E(level): From (p,p),(p,p′γ). Possible fragment of $3/2^-$ ^{59}Ni(2894 level) analogue. Jπ: 3/2 from γ(θ) in (p,γ); γ to $7/2^{(-)}$.
6712.3 *20*	$(1/2^-)$&		C	E(level): In (p,p),(p,p′γ) another $1/2^-$ state at 6707.8 *20* listed from a secondary reference, absent in primary reference 1976Ar01.
6727 *4*	$(3/2^-,5/2^-)$	65 eV *7*	BC	E(level): From (p,γ). Possible fragment of $3/2^-$ ^{59}Ni(2894 level) analogue. Jπ: 3/2,5/2 from (p,γ); γ to $7/2^{(-)}$; γ to $1/2^-$. May be same level as a $(1/2^-,3/2^-)$ level at 6724.2 *20* in (p,p),(p,p′γ).
6727.5 *20*	$(5/2^+)$&		C	
6748.9 *30*	$(1/2^+)$&	30 eV *10*	C	E(level): Two closeby level energies, 7647.2 *20* and 7648.9 *30* in (p,p),(p,p′γ) with same $1/2^+$ assignment, evaluator assume same state.
6749 *4*	$5/2^{(+)}$	140 eV *41*	BCd	XREF: d(6750). E(level): From (p,γ). Jπ: 5/2 from γ(θ) in (p,γ); $(5/2^+)$ in (p,p),(p,p′γ).
6750.0 *6*	$(17/2^+)$		L	Jπ: 1322.9γ to $(17/2^+)$, from (^{28}Si,2αpγ).
6760 *4*	$(3/2^-)$	50 eV *5*	BCd	XREF: d(6750). E(level): From (p,γ). Jπ: γ(θ) in (p,γ); analogue of $3/2^-$ ^{59}Ni(2894 level).
6769 *9*	$5/2^-,3/2^-$		B F	E(level): From (^{3}He,d), (^{3}He,dp). Jπ: L=3 in (^{3}He,d), (^{3}He,dp).
6797.3 *4*	$(19/2^+)$		L	Jπ: 1370.1γ to $(17/2^+)$, from (^{28}Si,2αpγ).
6811 *4*	$3/2^{(-)}$	110 eV *11*	BC	E(level): From (p,γ). Jπ: 3/2 from γ(θ) in (p,γ); π=− from (p,p),(p,p′γ).
6836 *4*	$(9/2^+)$	11.2 eV *4*	BC F	XREF: F(6847). E(level): From (p,γ). Possible fragment of $9/2^+$ ^{59}Ni(3054 level) analogue. Jπ: 9/2 from γ(θ) in (p,γ); L(^{3}He,d)=4. $(2J+1)\Gamma_p\Gamma_\gamma/\Gamma$=1.1 eV *1* (1976Ar01).
6836.5 *20*	$(3/2,1/2)^-$&	48 eV *4*	C	
6840.8 *20*	$(5/2^+)$&		C	
6842.1 *20*	$(1/2^-)$&	120 eV *12*	C	
6843 *4*	3/2		B d	XREF: d(6850). Jπ: 3/2 from γ(θ) in (p,γ). Differs from $(1/2)^-$, 6841.1 *24* level in (p,p),(p,p′γ) provided J from (p,p),(p,p′γ) is correct.
6867 *4*	$(3/2^-)$&	85 eV *8*	BC	E(level): From (p,γ).
6879 *4*	$(5/2^+)$&	70 eV *4*	BCd	XREF: d(6850). E(level): from (p,γ). Note another comparable resonance level energy, 6879.9 *20* with $1/2^+$ assignment from secondary reference. Jπ: Also 5/2 in (p,γ).
6885 *4*	$(3/2^-,5/2)$		B	Jπ: γ rays feed $7/2^-$ and $3/2^-$ and $3/2^+$ states.
6894 *4*	$5/2^{(-)}$		B	Jπ: 4570γ D to $3/2^{(-)}$, 5495γ D+Q to $7/2^-$.
6905 *4*	$9/2^+$	35.1 eV *15*	BCD F H J	XREF: C(6904.4)D(6900)F(6916). E(level): From (p,γ). Possible fragment of $9/2^+$ ^{59}Ni(3054 level) analogue. Jπ: L(α,t)=4; D γ $7/2^{(-)}$ and $11/2^{(-)}$.
6906.0 *20*	$(1/2^-)$&	50 eV *10*	C	
6922 *3*	$(17/2^-)$		L	Jπ: 3457γ (Q) to $(13/2)^-$.
6923 *4*	$(5/2^+)$&	230 eV *23*	BC	E(level): From (p,γ).

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[b]	XREF		Comments
6939 *4*	3/2$^{(-)}$		B		E(level),J$^{\pi}$: Possible analogue of 3132 or 3182 level of ^{59}Ni. D+Q γ to 1/2$^-$ and 5/2$^-$. Presumed to be different level from 1/2$^-$ levels at 6938.5 *20* and 6943.4 *20* in (p,p),(p,p$'\gamma$); however, J from (p,p),(p,p$'\gamma$) may not be reliable.
6940 *30*	5/2$^-$,7/2$^-$		D		J$^{\pi}$: L(d,n)=3.
6945 *4*	1/2$^-$,3/2$^-$		B	F	E(level): From (p,γ). Possible fragment of 3/2 ^{59}Ni(3182 level) analogue. J$^{\pi}$: L(^{3}He,d)=1. This level presumed to differ from 3/2$^+$, 6946.1 *20* level in (p,p),(p,p$'\gamma$).
6946.1 *20*	(3/2$^+$)[&]	310 eV *30*	C		
6959 *4*	(3/2)		B		J$^{\pi}$: from 1994Ho31 in (p,γ), presumably based on 6959$\gamma(\theta)$; possible fragment of ^{59}Ni(3182 level) analogue (J=3/2) (1994Ho31).
6967 *4*	(3/2,5/2)		BC		E(level): From (p,γ). Possible fragment of 3/2 ^{59}Ni(3182 level) analogue. Probably same as (1/2,3/2)$^-$ level or (3/2,5/2)$^+$ level at 6967.4 *22* and 6964.9 *22*, respectively, in (p,p),(p,p$'\gamma$). J$^{\pi}$: γ to 3/2$^-$ and 5/2$^-$.
6991.4 *20*	(5/2$^+$)[&]	140 eV *32*	BC		E(level): From (p,p),(p,p$'\gamma$).
7016 *4*		6.3 keV *6*	BC		XREF: C(7013.9). Probably same level as the 1/2$^+$, Γ=6.3 keV *6* level at 7013.9 *20* in (p,p),(p,p$'\gamma$).
7029 *4*	(3/2$^-$)[&]	82 eV *8*	BC		E(level): From (p,γ).
7042 *9*	7/2$^+$,9/2$^+$			F	J$^{\pi}$: L=4 in (^{3}He,d), (^{3}He,dp).
7048 *4*		29 eV *6*	BC		XREF: C(7043.1). Possibly same level as the 5/2$^+$, Γ=29 eV *6* level at 7043.1 *20* in (p,p),(p,p$'\gamma$).
7053.2[g] *4*	(19/2$^-$)			L	J$^{\pi}$: D+Q γ to (17/2$^-$), Q γ to (15/2$^-$), band assignment.
7074.4 *9*	(17/2$^+$)			L	J$^{\pi}$: Q γ to (13/2$^+$).
7075.3 *20*	(3/2$^-$)[&]	103 eV *15*	C		
7097.8 *20*	(3/2$^-$)[&]	335 eV *9*	C		
7106.7 *20*	(5/2$^+$)[&]	1.96 keV *20*	C		
7116 *9*	3/2$^+$,5/2$^+$		BCd	F	XREF: d(7120). J$^{\pi}$: L=2 in (^{3}He,d), (^{3}He,dp).
7129.9 *20*	(3/2$^-$)[&]	45 eV *5*	C		
7137.3 *11*	(5/2$^+$)[&]		BCd		XREF: d(7120). E(level): From (p,γ). J$^{\pi}$: L(d,n)=2 for possible doublet; probably the same level as the 7139.6 *20* (5/2$^+$) level in (p,p),(p,p$'\gamma$).
7137.9 *20*	(1/2$^-$)[&]	0.67 keV *3*	C		
7139.6 *20*	(5/2$^+$)[&]	0.90 keV *5*	C		
7152.0 *20*	(3/2$^-$)[&]	84 eV *20*	BC	F	E(level): From (p,p),(p,p$'\gamma$).
7174.4 *20*	(1/2$^+$)[&]	5.1 keV *5*	C		
7180.9 *20*	(1/2$^-$)[&]	700 eV *70*	C		
7188.7 *20*	(3/2$^+$)[&]	1.80 keV *17*	C		
7197 *4*	(3/2)		BC	F	XREF: C(7188.7). J$^{\pi}$: D(+Q) gammas to 1/2$^-$ and 5/2$^-$. 1994Ho31 suggest that this is analogue of the ^{59}Ni(3354 level) (J$^{\pi}$ unknown). L=2 in (^{3}He,d), (^{3}He,dp).
7209.0 *30*	(7/2$^-$)[&]	5 eV	C		
7231.5 *20*	(1/2$^-$)[&]	626 eV *36*	C		
7243.1 *20*	(5/2$^+$)[&]	65 eV *10*	C		

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
7243.5 *20*	(3/2⁻)[&]	63 eV *10*	C	
7248.2 *20*	(1/2⁻)[&]	70 eV *15*	C	
7251 *4*	(5/2,3/2⁻)[&]		B	Jπ: D γ to 3/2⁻; γ to 7/2⁻. 4586γ to (9/2⁻) favors 5/2, 1994Ho31, in (p,γ), suggest that this is analogue of a 3389-keV ^{59}Ni level, but the evaluator is uncertain which of the Adopted Levels corresponds to that state.
7274 *8*	(3/2)	1.95 keV *22*	BC F	XREF: C(7266.4). Jπ: L=1 in (^{3}He,d), (^{3}He,dp); 3/2⁺ in (p,p),(p,p′γ).
7287.5 *20*	(3/2⁻)[&]		C	
7288.4 *20*	(5/2⁺)[&]	422 eV *40*	C	
7299 *4*	(3/2)⁺		BCD	XREF: C(7291.1)D(7290). E(level): From (p,γ). Jπ: L(d,n)=2; J=3/2 favored by p-n correlation data in (d,np).
7321.5 *20*	(1/2⁺)[&]	2.22 keV *22*	C	
7332 *4*	3/2		BC	E(level): Possible fragment of 3/2⁻ ^{59}Ni(3452 level) analogue. Jπ: 3/2 from γ(θ) in (p,γ); need π=− for analogue. π=+ for 3 nearby levels in (p,p),(p,p′γ), but (p,γ) and (p,p),(p,p′γ) may excite different states.
7337.4 *20*	(1/2⁺)[&]	11.8 keV *12*	C	
7338.1 *20*	(5/2⁺)[&]	218 eV *40*	C	
7348 *4*	(3/2⁻)		B	E(level): Possible fragment of 3/2⁻ ^{59}Ni(3452 level) analogue. Jπ: D+Q γ to 3/2⁻, γ to 5/2⁻; π=− favored from δ(7347γ). Presumed to differ from 5/2⁻, 7349.5 *22* and 1/2⁻, 7349.9 *22* levels in (p,p),(p,p′γ).
7350.0 *20*	5/2⁻[&]	22 eV *5*	C	
7350.4 *30*	1/2⁻[&]	81 eV *10*	C	
7352.8[l] *4*	(19/2⁺)		L	Jπ: D γ to (17/2⁺), Q γ to (15/2⁺), band assignment.
7356.5 *20*	(3/2⁻)[&]	154 eV *20*	C f	XREF: f(7358).
7365.6 *20*	(5/2⁻)[&]	32 eV *10*	C f	XREF: f(7358).
7372.2 *20*	(3/2⁻)[&]	2.5 keV *2*	C	
7384.0 *20*	(5/2⁺)[&]	2.17 keV *30*	BC	E(level): From (p,p),(p,p′γ).
7394 *4*	(5/2)⁺		B F	E(level): From (p,γ). Note a comparable level at 7392.6 *20* in (p,p),(p,p′γ) may be the same level – but with 3/2⁻. Jπ: 5/2 from γ(θ) in (p,γ); L(^{3}He,d)=2. Possible analogue of 5/2$^{(+)}$ ^{59}Ni(3540 level).
7398.6 *20*	(3/2⁺)[&]	1.28 keV *16*	C	
7407 *4*	(1/2⁺)[&]	235 eV *25*	BC	
7413.4 *20*	(1/2⁻)[&]	215 eV *36*	C	
7434.4 *20*	(5/2⁺)[&]	0.60 keV *5*	C	
7444 *4*	(3/2⁺,5/2⁺)	1.84 keV *18*	B d F	XREF: d(7400). E(level): From (p,γ). Additional information 3. Jπ: L(^{3}He,d)=2 for 7447 *9* level. Probably same level as 3/2⁺, 7438.4 *22* level in (p,p),(p,p′γ).
7444.6[f] *3*	(21/2⁻)		L	Jπ: Q γ to (17/2⁻), D+Q γ to (19/2⁻), band assignment.
7450	7/2⁺,9/2⁺		D	E(level),Jπ: L=4 component of L(d,n)=3+4 doublet.
7456.7 *20*	(5/2⁻)[&]	10 eV *2*	C	
7461.4 *20*	(3/2⁺)[&]	60 eV *17*	C	
7473 *4*		260 eV *25*	BC	E(level): From (p,γ). May be same level as 3/2⁺, 7470.1 *20* and/or 3/2⁻, 7473.4 *20* level from (p,p),(p,p′γ). Other Γ=40 eV *11*.

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
7474.2 *22*	(1/2⁻)[&]	3.8 keV *4*	BC	E(level),Jπ: From (p,p),(p,p′γ). Possible analogue of 1/2⁻,3/2⁻ ^{59}Ni(3563 level).
7488.3 *20*	(5/2⁻)[&]	14 eV *4*	C	
7491.9 *20*	(1/2⁻)[&]	1.30 keV *12*	C	
7496.2 *20*	(1/2⁺)[&]	25 eV *15*	C	
7503 *4*	[&]	87 eV *11*	BC	E(level): From (p,γ). Probably comprised of two or more of 7496.2 *20* (1/2⁺), 7502.6 *20* (3/2⁻) and 7506.4 *20* (5/2⁺) levels from (p,p),(p,p′γ).
7506.4 *20*	(5/2⁺)[&]	1.03 keV *9*	C	
7511.7 *20*	(3/2⁺)[&]	1.52 keV *15*	C	
7512.3 *20*	(5/2⁻)[&]	55 eV *10*	C	
7517 *4*	(5/2⁻)[&]	51 eV *11*	BCd	XREF: C(7519)d(7450). Jπ: 5/2 in (p,γ).
7523 *4*			B	E(level): Four levels are reported near this energy in (p,p),(p,p′γ).
7525.2 *20*	(5/2⁻)[&]	49 eV *11*	C	
7525.9 *20*	(1/2⁺)[&]	2.3 keV *5*	C	
7527.7 *20*	3/2⁺,5/2⁺	1.85 keV *28*	C F	E(level): From (p,p),(p,p′γ). Jπ: L=2 in (^{3}He,d), (^{3}He,dp).
7528.7 *20*	(3/2⁻)[&]	28 eV *10*	C	
7539 *4*	(3/2⁻)[&]	0.37 keV *4*	BCd	XREF: d(7550). E(level): From (p,γ). Jπ: Also γ to 1/2⁻ state, 3/2⁻ state, 5/2⁻ state.
7543.1 *21*			L	
7616.5 *10*	(21/2⁻)		L	Jπ: 1894γ to (17/2⁻).
7650 *4*	5/2⁺		B d F	XREF: d(7730)F(7643). E(level): From (p,γ). Jπ: L(^{3}He,d)=2; D γ to 3/2⁻ and 7/2⁻.
7692 *9*	7/2⁺,9/2⁺		F	Jπ: L=4 in ^{58}Ni(^{3}He,d), (^{3}He,dp).
7697 *4*	(5/2)		B d	XREF: d(7730). Jπ: γ to 3/2⁻ and 5/2⁽⁺⁾ and 7/2⁻.
7708.6 *6*	(19/2⁺)		L	Jπ: 2281.1γ D+Q to (17/2⁺).
7730	7/2⁺,9/2⁺		D	Jπ: L(d,n)=4 component of E=7730, L=2+4 doublet.
7765.0		≈3.0 keV	C f	
7770.9		≈2.5 keV	BC f I	E(level): From (p,p),(p,p′γ).
7786.4		≈3.8 keV	C	
7794.7[c] *5*	(17/2⁺)		I L	Jπ: 2890γ d to (15/2⁻), γ to (13/2⁺).
7798.4		≈4.3 keV	C	
7802.5		≈2.5 keV	C	
7810 *30*			D	
7827.7[c] *5*	(17/2⁺)		L	Jπ: 2923γ d to (15/2⁻), γ to (13/2⁺).
7857.1		≈4.8 keV	C	
7895.2		≈11.1 keV	BC	
7901.0		≈6.5 keV	BC f	
7906.1		≈8.2 keV	C f	
7920 *30*	3/2⁺,5/2⁺		B D	Jπ: L(d,n)=2.
7940	7/2⁺,9/2⁺		D	Jπ: L(d,n)=4 component of E=7940, L=2+4 doublet.
7943.2		≈7.8 keV	C	
7946.3		≈1.2 keV	C	
7950.1		≈10.4 keV	BC	E(level): From (p,p),(p,p′γ).
7976.3		≈9.0 keV	C f	
7993.1		≈8.0 keV	C f	
8013 *4*		≈3.9 keV	BCD	XREF: D(8020). Possible analogue of 1/2⁻,3/2⁻ ^{59}Ni(4154 level).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
8016.9		≈6.4 keV	C	
8028.0		≈0.4 keV	BC	E(level): From (p,p),(p,p′γ).
8041.2		≈2.0 keV	C	
8044.1		≈3.0 keV	C	
8054.0		≈3.0 keV	BC	E(level): From (p,p),(p,p′γ).
8077 *4*	3/2(−),5/2	≈7.5 keV	BCD F	XREF: D(8100). Jπ: 8076γ D+Q to 3/2+; δ to π=− large if J=3/2.
8110.0		≈3.0 keV	C	
8112.0		≈9.0 keV	C	
8113.3[h] *8*	(21/2−)		L	Jπ: 2063.4γ Q to (17/2−), 1060γ D+Q to (19/2−), band assignment.
8116.0[k] *4*	(21/2+)		L	Jπ: 1426γ Q to (17/2+), 762.9γ D+Q to (19/2+), band assignment.
8126.7		≈13.0 keV	BC f	E(level): From (p,p),(p,p′γ).
8131.6		≈2.0 keV	C f	
8143.4		≈1.5 keV	BC	E(level): From (p,p),(p,p′γ).
8148.3		≈8.0 keV	C	
8155.6[m] *5*	(19/2+)		L	Jπ: D+Q γ to (17/2+), D γ to (17/2−), band assignment.
8182.8		≈37.5 keV	C	
8193 *6*	(5/2)+	≈6.6 keV	Cd F I	XREF: d(8210). E(level): Suggested 5/2+ ^{59}Ni(4506 level) analogue fragment (from (^{3}He,d)), but E is low cf. systematics. Jπ: L(^{3}He,d)=2; (5/2) from d-p angular correlation in (^{3}He,dp).
8202.5		≈4.8 keV	BC	E(level): From (p,p),(p,p′γ).
8208.4		≈3.4 keV	C	
8223 *4*	3/2(−),5/2		B d	XREF: d(8210). Jπ: 8222γ D+Q to 3/2−; δ to π=− large if J=3/2 (p,γ).
8227.0		≈3.0 keV	C	
8230	7/2+,9/2+		D	E(level),Jπ: L(d,n)=4 component of E=8230, L=2+4 doublet.
8236.8		≈4.5 keV	BC	E(level): From (p,p),(p,p′γ).
8242.7		≈2.5 keV	BC	E(level): From (p,p),(p,p′γ).
8259 *4*	(5/2)+	≈19.5 keV	BCD F I	XREF: D(8270). E(level): From (p,γ). Suggested 5/2+ ^{59}Ni(4506 level) analogue fragment (from (^{3}He,d)), but E is low cf. systematics. Jπ: L(^{3}He,d)=2; (5/2) from d-p angular correlation in (^{3}He,dp).
8266.3		≈18.1 keV	BCd	XREF: d(8270). E(level): From (p,p),(p,p′γ).
8276.1		≈7.2 keV	BC	E(level): From (p,p),(p,p′γ).
8281.0		≈2.8 keV	BC	E(level): From (p,p),(p,p′γ).
8285.5		≈1.6 keV	C	
8290.8		≈4.9 keV	C	
8315.4		≈7.7 keV	C	
8333.1		≈22.6 keV	BC	E(level): From (p,p),(p,p′γ).
8351.8		≈5.7 keV	C	
8367.4		≈0.5 keV	C	
8376.5		≈5.4 keV	C	
8397.9		≈5.9 keV	Cd	XREF: d(8390).
8400.5		≈1.8 keV	C	
8435.3		≈4.0 keV	C	
8447.1		≈1.4 keV	C	
8452.5		≈3.1 keV	C	
8459.9		≈9.6 keV	C	
8505.1		≈4.0 keV	C	
8513 *4*	(21/2−)		L	Jπ: 1591γ (Q) to (17/2−).
8515.9		≈12.0 keV	C	
8525.8		≈3.6 keV	C	
8540.5		≈9.0 keV	C	
8550 *8*	7/2+,9/2+		D F I	XREF: D(8630).

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
				E(level): From (^{3}He,d), (^{3}He,dp). Possible 7/2$^+$,9/2$^+$ ^{59}Ni(4709 level) analogue. Jπ: L(^{3}He,d)=4.
8564.1		≈5.9 keV	C	
8595.3		≈14.7 keV	C	
8614.7		≈0.9 keV	C	
8648.6		≈9.8 keV	C	
8656.9		≈3.7 keV	C	
8657.7 *15*	(21/2$^+$)		L	Jπ: 3230γ Q to (17/2$^+$).
8667.3		≈5.2 keV	C	
8679.1		≈8.8 keV	C	
8691.4		≈5.9 keV	C	
8702.7		≈10.0 keV	C	
8722.8		≈6.8 keV	C	
8729.8[n] *5*	(21/2$^+$)		L	Jπ: 3302γ Q to (17/2$^+$), 574.1γ D+Q to (19/2$^+$), band assignment.
8732.7		≈6.8 keV	C	
8745.9		≈2.9 keV	C	
8764.6		≈13.9 keV	C	
8771.7		≈4.7 keV	C	
8813.8[e] *4*	(23/2$^-$)		L	Jπ: 2204γ Q to (19/2$^-$), 1368.7γ D+Q to (21/2$^-$), band assignment.
8831.6		≈17.3 keV	C	
8842.4		≈5.8 keV	C	
8852.6 *6*	(21/2$^-$)		L	Jπ: 2055.5γ D to (19/2$^+$).
8862.2		≈7.1 keV	C	
8883.4		≈4.1 keV	C	
8888.3		≈5.7 keV	C	
8899.3		≈25.0 keV	C J	E(level): From (p,p),(p,p′γ).
8918.9		≈6.0 keV	C	
8932.7		≈6.0 keV	C	
8940.5		≈13.7 keV	C	
8943.5[l] *4*	(23/2$^+$)		L	Jπ: 1591.1γ Q to (19/2$^+$), 827.4γ D+Q to (21/2$^+$), band assignment.
8948.4		≈6.1 keV	C	
8954.3		≈4.0 keV	C	
8960.2		≈2.8 keV	C	
8977.9		≈1.1 keV	C	
8989.4		≈2.5 keV	C	
8992.2		≈7.6 keV	C	
9001.8		≈10.4 keV	C	
9014.3		≈4.0 keV	C	
9020.2		≈0.9 keV	C	
9029.0		≈6.8 keV	C	
9042.8		≈7.7 keV	C	
9059.0	$^+$	≈6.0 keV	CD	E(level): From (p,p),(p,p′γ). Jπ: L(d,n)=4+2 doublet.
9077.2		≈4.8 keV	C	
9086.0		≈20.3 keV	C	
9112.1		≈11.5 keV	C	
9121.7		≈1.1 keV	C	
9129.8		≈0.8 keV	C	
9156.3		≈11.9 keV	C	
9170.5		≈6.0 keV	C	
9174.5[g] *6*	(23/2$^-$)		L	Jπ: 2121.4γ Q to (19/2$^-$), 1061γ D+Q to (21/2$^-$), band assignment.
9175.3 *15*	(21/2$^+$)		L	Jπ: 3748γ Q to (17/2$^+$).
9188.2		≈35.0 keV	C	
9252 *20*			F	
9280	$^+$		D	E(level),Jπ: L(d,n)=4+2 doublet.

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
9293.8 *15*	(21/2$^+$)	L	J$^{\pi}$: 3867γ Q to (17/2$^+$).
9333.3 *5*	(23/2$^-$)	I L	J$^{\pi}$: γ to (21/2$^-$) and (19/2$^-$).
9433.2 *8*	(21/2$^+$)	L	J$^{\pi}$: D+Q γ to (19/2$^+$).
9457.4[m] *5*	(23/2$^+$)	L	J$^{\pi}$: 1302.1γ Q to (19/2$^+$), 727.5γ D+Q to (21/2$^+$), band assignment.
9626.1 *12*	(21/2$^+$)	L	J$^{\pi}$: 4200γ to (19/2$^+$).
9673.0[k] *4*	(25/2$^+$)	L	J$^{\pi}$: 1557.1γ Q to (21/2$^+$), 729.4γ D+Q to (23/2$^+$), band assignment.
9780	$^+$	D	E(level),J$^{\pi}$: L(d,n)=4+2 doublet.
9923.4 *11*	(21/2$^+$)	L	J$^{\pi}$: γ to (17/2$^+$).
10120.3 *8*	(21/2$^+$)	L	J$^{\pi}$: γ to (19/2$^+$) and (19/2$^-$).
10130	$^+$	D	E(level),J$^{\pi}$: L(d,n)=4+2 doublet.
10143.0 *7*	(21/2$^+$)	L	J$^{\pi}$: 4716γ Q to (17/2$^+$), 2433γ D+Q to (19/2$^+$).
10225.2 *12*	(21/2$^+$)	L	J$^{\pi}$: γ to (19/2$^-$).
10277.8[n] *5*	(25/2$^+$)	L	J$^{\pi}$: 1548.8γ Q to (21/2$^+$), 819.8γ D+Q to (23/2$^+$), band assignment.
10363.3 *10*	(21/2$^+$)	L	J$^{\pi}$: 4937γ Q to (17/2$^+$), γ to (19/2$^-$).
10372.3[h] *7*	(25/2$^-$)	L	J$^{\pi}$: 2259γ Q to (21/2$^-$), 1197.8γ D+Q to (23/2$^-$), band assignment.
10381.4 *9*	(21/2$^+$)	L	J$^{\pi}$: γ to (19/2$^+$) and (19/2$^-$).
10500	$^+$	D	E(level),J$^{\pi}$: L(d,n)=4+2 doublet.
10605.2[l] *5*	(27/2$^+$)	L	J$^{\pi}$: 1662.0γ Q to (23/2$^+$), 932.1γ D+Q to (25/2$^+$), band assignment.
10657.4 *19*	(21/2$^-$)	L	J$^{\pi}$: 4047γ to (19/2$^-$).
10679.0[u] *9*	(21/2$^-$)	L	J$^{\pi}$: 4957γ Q to (17/2$^-$), γ to (19/2$^-$), band assignment.
10824.0 *5*	(25/2$^-$)	L	J$^{\pi}$: 2010.4γ (D+Q) to (23/2$^-$).
10867 *3*	(23/2$^-$)	L	J$^{\pi}$: 3422γ D+Q to (21/2$^-$).
11100		K	E(level): double IAS from (π^+,π^-).
11122.4[v] *6*	(23/2$^-$)	L	J$^{\pi}$: 3007γ D to (21/2$^+$), D+Q γ to (21/2$^-$), band assignment.
11213.4[m] *5*	(27/2$^+$)	L	J$^{\pi}$: 1756.3γ Q to (23/2$^+$), γ to (25/2$^+$), band assignment.
11216.6 *10*	(23/2$^+$)	L	J$^{\pi}$: γ to (19/2$^+$) and (21/2$^+$).
11250 *3*	(23/2)	L	J$^{\pi}$: 3805γ D to (21/2$^-$).
11371.4 *11*	(25/2$^-$)	L	J$^{\pi}$: 3626γ Q to (21/2$^-$).
11660.8[g] *8*	(27/2$^-$)	L	J$^{\pi}$: 2486γ Q to (23/2$^-$), γ to (25/2$^-$), band assignment.
11721.3[u] *6*	(25/2$^-$)	L	J$^{\pi}$: 4277γ Q to (21/2$^-$), 598.8γ D to (23/2$^-$), band assignment.
11839.2 *7*	(25/2$^+$)	L	J$^{\pi}$: 1614γ Q to (21/2$^+$), 2896γ D+Q to (23/2$^+$).
11919.4[c] *6*	(25/2$^+$)	L	J$^{\pi}$: Q γ to (21/2$^+$), D γ to (23/2$^-$), and D+Q γ to (23/2$^+$).
11938.3[s] *5*	(25/2$^-$)	L	J$^{\pi}$: γ to (21/2$^-$).
11983.3[‡cq] *13*	(23/2$^-$)	L	J$^{\pi}$: γ to (19/2$^-$).
12040.8[c] *7*	(25/2$^+$)	L	J$^{\pi}$: 3922γ Q to (21/2$^+$), 2584γ D+Q to (23/2$^+$).
12112.6 *10*	(27/2$^-$)	L	J$^{\pi}$: Q γ to (23/2$^-$).
12245.4 *9*	(25/2$^+$)	L	J$^{\pi}$: Q γ to (21/2$^+$), D γ to (23/2$^-$).
12248.9[n] *5*	(29/2$^+$)	L	J$^{\pi}$: Q γ to (25/2$^+$), D+Q γ to (27/2$^+$).
12375.4[v] *6*	(27/2$^-$)	L	J$^{\pi}$: Q γ to (23/2$^-$), D+Q γ to (25/2$^-$), band assignment.
12420.7[k] *6*	(29/2$^+$)	L	J$^{\pi}$: γ to (25/2$^+$), D+Q γ to (27/2$^+$), band assignment.
12554.1[t] *5*	(27/2$^-$)	L	J$^{\pi}$: γ to (23/2$^-$), D γ to (25/2$^+$), band assignment.
12810.0 *6*	(29/2)	L	J$^{\pi}$: D+Q γ to (27/2$^+$).
12859.4[r] *19*	(25/2$^-$)	L	Additional information 4. J$^{\pi}$: From band assignment.
13105.5[u] *6*	(29/2$^-$)	L	J$^{\pi}$: Q γ to (25/2$^-$), D+Q γ to (27/2$^-$), band assignment.
13128.1[‡q] *12*	(27/2$^-$)	L	J$^{\pi}$: Q γ to (23/2$^-$), band assignment.
13195.6[s] *5*	(29/2$^-$)[a]	L	
13353.5[o] *8*	(29/2$^+$)[a]	L	
13360.5[m] *6*	(31/2$^+$)[a]	L	
13422.6 *18*	(29/2$^-$)[a]	L	
13480.8[p] *18*	(27/2$^+$)[a]	L	
13520.4[h] *15*	(29/2$^-$)[a]	L	

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
13528.6 *6*	(31/2)[a]	L	
13920.3[v] *6*	(31/2⁻)[a]	L	
13934.4[t] *7*	(31/2⁻)[a]	L	
14237.9[r] *9*	(29/2⁻)[a]	L	
14519.4 *6*	(33/2)[a]	L	
14586.9[n] *7*	(33/2⁺)[a]	L	
14654.1[‡q] *12*	(31/2⁻)[a]	L	
14700.4 *22*		L	
14784.3[s] *6*	(33/2⁻)[a]	L	
14952.8[o] *9*	(33/2⁺)[a]	L	
14957.3[u] *8*	(33/2⁻)[a]	L	
15331.6[p] *16*	(31/2⁺)[a]	L	
15726.1[t] *7*	(35/2⁻)[a]	L	
15900		J	
15958.9[r] *11*	(33/2⁻)[a]	L	
15986.0[v] *9*	(35/2⁻)[a]	L	
16032.5[m] *11*	(35/2⁺)[a]	L	
16505.5 *24*		L	
16561.1[‡q] *16*	(35/2⁻)[a]	L	
16756.8[s] *8*	(37/2⁻)[a]	L	
16852.6[o] *11*	(37/2⁺)[a]	L	
17125.1[u] *10*	(37/2⁻)[a]	L	
17607.7[p] *19*	(35/2⁺)[a]	L	
17830.2[n] *16*	(37/2⁺)[a]	L	
17884 *4*		L	
17963.1[t] *12*	(39/2⁻)[a]	L	
18029.0[r] *13*	(37/2⁻)[a]	L	
18310.3[v] *11*	(39/2⁻)[a]	L	
18680 *3*		L	
18883[‡q] *3*	(39/2⁻)[a]	L	
18955 *3*		L	
19095.1[o] *13*	(41/2⁺)[a]	L	
19428.5[s] *13*	(41/2⁻)	L	Additional information 5.
19672.3[u] *11*	(41/2⁻)[a]	L	
19837[m] *4*	(39/2⁺)[a]	L	
19918 *4*	(39/2⁺)[a]	L	
19930.7[p] *22*	(39/2⁺)[a]	L	
20524.1[r] *17*	(41/2⁻)[a]	L	
20708 *3*		L	
21096.3[v] *17*	(43/2⁻)[a]	L	
21258[t] *4*	(43/2⁻)[a]	L	
21641[‡q] *4*	(43/2⁻)[a]	L	
21706.1[o] *17*	(45/2⁺)[a]	L	
22051 *4*	(41/2⁺)[a]	L	
22580[p] *3*	(43/2⁺)[a]	L	
22686.4[u] *17*	(45/2⁻)[a]	L	
23459[r] *3*	(45/2⁻)[a]	L	
23529[s] *4*	(45/2⁻)[a]	L	
24318.6[v] *20*	(47/2⁻)[a]	L	
24710[o] *3*	(49/2⁺)[a]	L	
24769[‡q] *4*	(47/2⁻)[a]	L	
25679[p] *5*	(47/2⁺)[a]	L	

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Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[b]	XREF	Comments
26226[u] *4*	(49/2⁻)[a]		L	
26840?[r] *4*	(49/2⁻)[a]		L	
27900		7.0 MeV *10*	K	E(level),$T_{1/2}$: from (π^+,π^-). For GDR⊗IAS resonance; not a discrete level. See source dataset for parameters for $T_<$ and $T_>$ components of resonance.
28134[o] *3*	(53/2⁺)[a]		L	
31961[o] *3*	(57/2⁺)[a]		L	
x[w]	(J)		L	Additional information 6.
1631.0+x[w] *10*	(J+2)		L	Additional information 7.
3647.0+x[w] *10*	(J+4)		L	
6005.1+x[w] *15*	(J+6)		L	
8812.2+x[w] *25*	(J+8)		L	

† From least-squares adjustment of adopted Eγ when measured data are available (i.e., excluding Eγ derived from level energy differences). Uncertainty doubled for two γ-rays, out of 327, during the fit, 1788.1γ from 6690.4 and 802.7γ from 4904.0 (std. dev. was 3 to 4). Without the increase χ^2=1.5 and χ^2=1.3 (critical). Five level energies, 4530.0, 5721.3, 7444, 12859.4, 19428.5-keV were held fixed for least-squares fit. Other E(level) from their unenumerated Eγ data (1978Sc07 in (^{3}He,dγ) and 1985Di05, 1975Kl06, 1975Co21 in (p,γ)), E(level) from resonance E(p) and S(p) (from 1957Bu64, 1970Ho34 in (p,γ)), E(level) from (p,p),(p,p′γ) (for E>6305) and/or E(level) from Zn ε decay, otherwise. Data from (p,p),(p,p′γ) for E≤6305 are ≈8 keV low, and data from (^{3}He,d) are typically 5-10 keV high for E>3 MeV; consequently, these values are considered only in the absence of information from other sources. For E(level)>6500, all possible analogue levels and levels from which γ rays have been observed are included in this table. Note that level energy deduced from least squares fit of adopted γ lead to about 1 to 2 keV difference compared to level energies in (^{28}Si,2αpγ) dataset.

‡ 2000An32 labeled the 11923, 25/2⁺ level as the lowest energy member of the SD band but, from the decay pattern given in fig. 1 of 2000An32, the 12042, 25/2⁺ level can equally well be considered to be the lowest member. Authors C.E. Svensson and J.C. Waddington seem to confirm the viewpoint that it is difficult to distinguish between these levels as to which one is the lowest energy band member. Moreover, the two levels are likely to have heavily mixed configurations, as noted (dated April 2001) by C.M. Baglin in previous evaluation (2002Ba42).

Jπ assignments given without comment are from ^{40}Ca(^{28}Si,2αpγ) (2002An20). The assignments are based on multipolarities from γγ(θ)(DCO) data for selected transitions and on band associations or only based on transition multipolarities.

@ L=1 for levels at E(d,n)=2299 and E(^{3}He,d)=2323 *7*.

& From R-matrix resonance parameters for σ(E(p),θ) in (p,p),(p,p′γ).

[a] Assignment from (^{28}Si,2αpγ), based on (partial or all) γ-ray multipolarity, placement in the level, and band assignment.

[b] For E<5230: from ^{58}Ni(^{3}He,dγ) DSA (1974Ne08), except as noted. For E≥5230: Γ from (p,p),(p,p′γ), except as noted.

[c] Level deexcitation: Prompt proton emission competes with γ rays.

[d] Band(A): $p_{3/2}$.

[e] Band(B): $f^{-1}_{7/2}$, α=−1/2.

[f] Band(b): $f^{-1}_{7/2}$, α=+1/2.

[g] Band(C): Band based on 19/2⁻, α=−1/2.

[h] Band(c): Band based on 17/2⁻, α=+1/2.

[i] Band(D): $f_{5/2}$.

[j] Band(E): Band based on 9/2⁺.

[k] Band(F): Band based on 17/2⁺, α=+1/2.

[l] Band(f): Band based on 15/2⁺, α=−1/2.

[m] Band(G): Band based on 19/2⁺, α=−1/2. Average Q_t=1.25 *+13−10*, β_2=0.24 *2*.

[n] Band(g): Band based on 21/2⁺, α=+1/2. Average Q_t=1.25 *+13−10*, β_2=0.24 *2*.

[o] Band(H): SD-1 band (2000An32,2002An20). Average Q_t=2.23 *+27−22* (2002An20), β_2=0.41 *5*. Configuration=$\nu 4^2 \pi 4^1$. Percent

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{59}Cu Levels (continued)

population=30% relative to I(γ+ce) Iγ(1399γ) (2000An32).

[p] Band(h): SD-2 band (?) α=−1/2 (2002An20). Possible signature partner of SD-1 band (2002An20).

[q] Band(I): Band based on 23/2$^-$, α=−1/2. Average Q_t=1.95 *+33−25* (2002An20), β_2=0.36 *4*. Highly-deformed band.

[r] Band(i): Band based on 25/2$^-$, α=+1/2. Average Q_t=1.95 *+33−25* (2002An20), β_2=0.36 *4*. Highly-deformed band.

[s] Band(J): Band based on 25/2$^-$, α=+1/2.

[t] Band(j): Band based on 27/2$^-$, α=−1/2.

[u] Band(K): Band based on 21/2$^-$, α=+1/2.

[v] Band(k): Band based on 23/2$^-$, α=−1/2.

[w] Band(L): Band structure.

Adopted Levels, Gammas (continued)

γ(^{59}Cu)

E_i(level)	J_i^π	E_γ †	I_γ [h]	E_f	J_f^π	Mult. [k]	δ [ko]	α [n]	Comments
491.5	1/2$^-$	491.22 [c] *10*	100	0.0	3/2$^-$	M1(+E2)	<0.31	0.00108 *6*	α(K)=0.00097 *5*; α(L)=9.6×10^{-5} *6*; α(M)=1.36×10^{-5} *8* α(N)=4.12×10^{-7} *21* B(M1)(W.u.)>0.18; B(E2)(W.u.)<3.0×10^2 Mult.: from α(K)exp in (^{3}He,pnγ). δ: <0.9 from α(K)exp in (^{3}He,pnγ); <0.37 is expected from RUL.
914.2	5/2$^-$	422.6 [f p] *2*	0.7 [i] *2*	491.5	1/2$^-$				
		913.90 *12*	100 [i] *3*	0.0	3/2$^-$	M1+E2	−0.21 *2*	2.71×10^{-4}	B(M1)(W.u.)<0.025; B(E2)(W.u.)<2.9 α(K)=0.000244 *4*; α(L)=2.40×10^{-5} *4*; α(M)=3.38×10^{-6} *5* α(N)=1.037×10^{-7} *15* E_γ: Unweighted average from ε decay, (p,γ), (^{3}He,pnγ), (^{3}He,dγ), and (^{28}Si,2αpγ). Mult.,δ: Mult from (^{3}He,pnγ). −0.21 *2* or −1.75 *12* from (p,γ); δ<0.7 from α(K)exp in (^{3}He,pnγ). Other: −0.8 *+5−9* from (^{3}He,pnγ).
1398.8	7/2$^-$	484.40 [a] *14*	15.9 [j] *12*	914.2	5/2$^-$	M1+E2	−0.05 *1*	1.06×10^{-3}	α(K)=0.000951 *14*; α(L)=9.47×10^{-5} *14*; α(M)=1.332×10^{-5} *19* α(N)=4.06×10^{-7} *6* B(M1)(W.u.)=0.07 *3*; B(E2)(W.u.)=1.3 *8* Mult.,δ: Mult from (^{3}He,pnγ). δ from (^{28}Si,2αpγ); Other: −0.09 *12* (^{3}He,pnγ).
		1398.44 [a] *22*	100.0 *17*	0.0	3/2$^-$	E2		1.80×10^{-4}	B(E2)(W.u.)=17 *8* α(K)=0.0001135 *16*; α(L)=1.119×10^{-5} *16*; α(M)=1.573×10^{-6} *22* α(N)=4.81×10^{-8} *7*; α(IPF)=5.32×10^{-5} *8* Mult.: δ(Q,O)=−0.09 *12* in (p,γ); mult=Q from (p,γ), mult=M1,E2 from (^{3}He,pnγ).
1864.8	7/2$^-$	465.8 *1*	27.3 *18*	1398.8	7/2$^-$				I_γ: Others: 59.0 *16* (^{28}Si,2αpγ), 38 in (^{3}He,dγ), 98 in (^{3}He,pnγ).
		950.90 [a] *25*	100.0 *18*	914.2	5/2$^-$	M1(+E2)	0.00 *5*	2.47×10^{-4}	α(K)=0.000222 *4*; α(L)=2.19×10^{-5} *3*; α(M)=3.08×10^{-6} *5* α(N)=9.47×10^{-8} *14* Mult.: M1,E2 from (^{3}He,pnγ); D(+Q) from (p,γ). δ: weighted average of −0.02 *6* in (^{3}He,pnγ) and +0.10 *12* in (p,γ).
		1864.9 [b] *4*	54.6 *18*	0.0	3/2$^-$	E2		3.18×10^{-4}	α(K)=6.43×10^{-5} *9*; α(L)=6.32×10^{-6} *9*; α(M)=8.88×10^{-7} *13* α(N)=2.73×10^{-8} *4*; α(IPF)=0.000247 *4* Other Iγ: 75 in (^{3}He,dγ), 85 in (^{3}He,pnγ). Mult.,δ: Mult from (^{3}He,pnγ). δ(Q,O)=−0.03 *4* in (p,γ).

$^{59}_{29}Cu_{30}$-18

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
1988.1	5/2$^{(+)}$	1988.03 *20*	100	0.0	3/2$^-$	D+Q	−1.23 *9*		E_γ: weighted average from (^{3}He,pnγ) and (p,γ). δ: if mult=E1+M2, δ implies $T_{1/2}$>40 ps based on RUL.
2266.5	3/2$^+$	1775.4 *5*	92.3 *19*	491.5	1/2$^-$	D+Q	+1.9 *7*		E_γ: weighted average from (^{3}He,dγ) and (p,γ). Other Iγ: 104 in (^{3}He,dγ), ≈118 in (^{3}He,pnγ). Mult.: Δπ=yes from level scheme; however, δ(E1,M2)<0.063 is expected from RUL.
		2266.1 *6*	100.0 *19*	0.0	3/2$^-$	D+Q	+1.0 *6*		E_γ: weighted average from (^{3}He,pnγ) and (p,γ).
2318.5	1/2$^{(-)}$,5/2$^{(-)}$	1827[f] *1*	20.5 *12*	491.5	1/2$^-$				
		2318[#]	100.0 *12*	0.0	3/2$^-$				
2324.1	3/2$^-$	337[f] *1*		1988.1	5/2$^{(+)}$				E_γ: reported only in a (^{3}He,pnγ) study in which the 1409γ and 2324γ, known to de-excite the 2324 level, were absent.
		1409.1[g] *4*	11.1 *11*	914.2	5/2$^-$	(M1+E2)	−1.4 *12*	1.72×10^{-4} *16*	α(K)=0.000109 *6*; α(L)=1.07×10^{-5} *6*; α(M)=1.50×10^{-6} *9* α(N)=4.61×10^{-8} *24*; α(IPF)=5.2×10^{-5} *9* B(M1)(W.u.)=0.011 *+13−10*; B(E2)(W.u.)=20 *12* Other Iγ: 13.6 in (^{3}He,dγ).
		2324.0[g] *2*	100.0 *11*	0.0	3/2$^-$	M1		4.44×10^{-4}	α(K)=4.17×10^{-5} *6*; α(L)=4.08×10^{-6} *6*; α(M)=5.74×10^{-7} *8* α(N)=1.772×10^{-8} *25*; α(IPF)=0.000398 *6* B(M1)(W.u.)=0.063 *11* δ(D,Q)=−0.03 *6* from (p,γ).
2390.8	9/2$^-$	991.5 *7*	11.8[i] *8*	1398.8	7/2$^-$	D+Q	−0.08 *+7−10*		E_γ: Unweighted ave. of data from (^{3}He,pnγ) and (^{28}Si,2αpγ). Mult.,δ: From (^{28}Si,2αpγ).
		1476.7 *2*	100[i] *3*	914.2	5/2$^-$	E2		1.91×10^{-4}	α(K)=0.0001015 *15*; α(L)=9.99×10^{-6} *14*; α(M)=1.405×10^{-6} *20* α(N)=4.30×10^{-8} *6*; α(IPF)=7.82×10^{-5} *11* E_γ: Weighted ave. of data from (^{3}He,pnγ) and (^{28}Si,2αpγ). Mult.: from (^{3}He,pnγ).
2587.3	11/2$^-$	196.3 *2*	5.2[i] *13*	2390.8	9/2$^-$				
		722.8[f] *2*	≈1.2[f]	1864.8	7/2$^-$				
		1188.4 *9*	100[i] *6*	1398.8	7/2$^-$	Q[i]			E_γ: Unweighted average of data from (^{3}He,pnγ) and (^{28}Si,2αpγ).
2664.6	(9/2$^-$)	798.9 *4*	100[i] *3*	1864.8	7/2$^-$	D+Q	+0.32 *4*		E_γ: Unweighted average of data from (^{3}He,pnγ) and (^{28}Si,2αpγ). Mult.: from (^{3}He,pnγ). δ: weighted average of +0.35 *10* in (p,γ) and +0.31 *5* in (^{3}He,pnγ).

$^{59}_{29}Cu_{30}$-19

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [h]	E_f	J_f^π	Mult. [k]	δ [ko]	α [n]	Comments
2664.6	(9/2$^-$)	1265.1 *7*	7.1 [i] *5*	1398.8	7/2$^-$				E_γ: Unweighted average of data from (^{3}He,pnγ) and (^{28}Si,2αpγ).
2706.3	5/2$^-$	1307#	23.7 *17*	1398.8	7/2$^-$				
		1792.0 [f] *2*	100.0 *17*	914.2	5/2$^-$	D(+Q)	−0.09 *10*		
		2215#	45.8 *17*	491.5	1/2$^-$	Q			δ(Q,O)=0.0 *5* from (p,γ).
2715.3	7/2$^-$	727.5 [f] *2*	41 *3*	1988.1	5/2$^{(+)}$				Other Iγ: 77 in (^{3}He,pnγ).
		1316#	54 *3*	1398.8	7/2$^-$	D+Q	+1.3 *4*		
		1801.0 [f] *2*	76 *3*	914.2	5/2$^-$	D+Q	−3.3 *6*		Other Iγ: 33 in (^{3}He,pnγ).
		2714.6 [f] *2*	100 *3*	0.0	3/2$^-$	Q			δ(Q,O)=0.00 *8* from (p,γ).
2928	5/2$^{(-)}$	940#	24.4 *22*	1988.1	5/2$^{(+)}$	D+Q	+2.4 *27*		
		2014#	100.0 *22*	914.2	5/2$^-$	D(+Q)	+0.15 *25*		
		2436#	22.2 *22*	491.5	1/2$^-$				
		2928#	75.6 *22*	0.0	3/2$^-$				
2992.0	3/2,5/2$^-$,7/2$^-$	1004#	8.6 *17*	1988.1	5/2$^{(+)}$				
		2078#	100.0 *17*	914.2	5/2$^-$				
		2992#	63.8 *17*	0.0	3/2$^-$				
3024.8	5/2$^{(-)}$	2111#	33.3 *22*	914.2	5/2$^-$				
		2533.6#	88.9 *22*	491.5	1/2$^-$				
		3024#	100.0 *22*	0.0	3/2$^-$				
3042.5	9/2$^+$	455.33 [a] *12*	1.8 [i] *5*	2587.3	11/2$^-$	(E1)		6.79×10^{-4}	α(K)=0.000610 *9*; α(L)=6.03×10^{-5} *9*; α(M)=8.47×10^{-6} *12* α(N)=2.56×10^{-7} *4* B(E1)(W.u.)=0.00010 *5*
		1177.47 [a] *20*	26.3 *13*	1864.8	7/2$^-$	(E1+M2)	+0.023 *13*	1.23×10^{-4}	α(K)=7.68×10^{-5} *11*; α(L)=7.54×10^{-6} *11*; α(M)=1.059×10^{-6} *15* α(N)=3.25×10^{-8} *5*; α(IPF)=3.72×10^{-5} *6* B(E1)(W.u.)≈9.0×10^{-5}; B(M2)(W.u.)≈0.16 I_γ: Other: 38.6 *18* (^{28}Si,2αpγ). Mult.: D+Q in (^{28}Si,2αpγ), D(+Q) in (^{3}He,pnγ) and (p,γ). δ: Wt. ave. of −0.07 *+5−6* in (^{3}He,pnγ), +0.011 *18* in (p,γ), and +0.03 *1* (^{28}Si,2αpγ).
		1644.2 [b] *4*	100.0 *13*	1398.8	7/2$^-$	E1+M2	+0.027 *10*	4.19×10^{-4}	α(K)=4.37×10^{-5} *7*; α(L)=4.28×10^{-6} *6*; α(M)=6.01×10^{-7} *9* α(N)=1.85×10^{-8} *3*; α(IPF)=0.000371 *6* B(E1)(W.u.)=0.00012 *5*; B(M2)(W.u.)=0.14 *13* Mult.: E1 in (^{3}He,pnγ), D+Q in (p,γ). δ: Other: −0.02 *5* in (^{3}He,pnγ).

$^{59}_{29}Cu_{30}$-20

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
3042.5	9/2$^+$	2128.5[#]	4.0 *13*	914.2	5/2$^-$	[M2]		2.69×10^{-4}	α(K)=8.34×10^{-5} *12*; α(L)=8.21×10^{-6} *12*; α(M)=1.155×10^{-6} *17* α(N)=3.56×10^{-8} *5*; α(IPF)=0.0001760 *25* Yields B(M2)(W.u)=2.2 *12* − larger than RUL=1.
		3042.4[#]	1.3 *13*	0.0	3/2$^-$	[E3]		6.02×10^{-4}	α(K)=4.01×10^{-5} *6*; α(L)=3.94×10^{-6} *6*; α(M)=5.54×10^{-7} *8* α(N)=1.705×10^{-8} *24*; α(IPF)=0.000557 *8* B(E3)(W.u.)=4.E+1 *4* γ from (p,γ); absent in (^{3}He,pnγ) and (^{3}He,dγ).
3114.4	5/2$^-$	2623[#]	38.9 *14*	491.5	1/2$^-$	[E2]		6.51×10^{-4}	B(E2)(W.u.)=7 *4* α(K)=3.51×10^{-5} *5*; α(L)=3.44×10^{-6} *5*; α(M)=4.83×10^{-7} *7* α(N)=1.489×10^{-8} *21*; α(IPF)=0.000612 *9*
		3114.0[g] *5*	100.0 *14*	0.0	3/2$^-$	M1+E2		0.00081 *5*	B(M1)(W.u.)=0.019 *11*; B(E2)(W.u.)=3.6 *21* α(K)=2.61×10^{-5} *6*; α(L)=2.55×10^{-6} *6*; α(M)=3.59×10^{-7} *8* α(N)=1.107×10^{-8} *22*; α(IPF)=0.00078 *5* Mult.: D+Q from (p,γ); RUL requires δ(E1,M2)<0.11. δ: +0.52 *10* or +4.2 *10* in (p,γ).
3121.9?		2207[f] *1*		914.2	5/2$^-$				
		2631[f] *1*		491.5	1/2$^-$				
3129.9	3/2$^-$	2215.7[g] *3*	100 *3*	914.2	5/2$^-$				
		2638.6[g] *3*	97 *3*	491.5	1/2$^-$				Other Iγ: 72 in (^{3}He,dγ).
		3129.5[g] *2*	81 *3*	0.0	3/2$^-$				Other Iγ: 141 in (^{3}He,dγ).
3309	7/2$^{(-)}$	1910[#]	66.7 *22*	1398.8	7/2$^-$				
		2395[#]	100.0 *22*	914.2	5/2$^-$				
		3309[#]	56.0 *22*	0.0	3/2$^-$				
3329.4	(11/2$^-$)	664.9[&] *4*	100[i] *4*	2664.6	(9/2$^-$)	M1+E2	+0.12 *4*	5.28×10^{-4}	α(K)=0.000474 *7*; α(L)=4.70×10^{-5} *7*; α(M)=6.61×10^{-6} *10* α(N)=2.02×10^{-7} *3* Mult.,δ: Mult from (^{3}He,pnγ). δ from wt. ave. of +0.15 *+4−5* (^{28}Si,2αpγ) and +0.09 *5* (^{3}He,pnγ).
		741.75[&] *20*	25.9[i] *19*	2587.3	11/2$^-$	D+Q	+0.8 *+3−2*		
		938.9 *4*	3.7[i] *6*	2390.8	9/2$^-$	D+Q[i]			Eγ: From (^{28}Si,2αpγ).
		1464.16[&] *20*	48.1[i] *19*	1864.8	7/2$^-$	Q[i]			
		1931.1[&] *4*	13.3[i] *7*	1398.8	7/2$^-$	Q			Mult.: from (^{3}He,pnγ).
3434	5/2	2520[#]	100.0 *14*	914.2	5/2$^-$				

$^{59}_{29}Cu_{30}$-21

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
3434	5/2	3434[#]	42.9 *14*	0.0	3/2$^-$				
3438	(1/2)	3438[#]	100	0.0	3/2$^-$				
3447.1	13/2$^-$	860.15[&] *20*	19.0[i] *24*	2587.3	11/2$^-$	D+Q	≈−1		Mult.,δ: from (^{3}He,pnγ).
		1056.4[&] *2*	100[i] *5*	2390.8	9/2$^-$	E2		2.34×10^{-4}	α(K)=0.000211 *3*; α(L)=2.09×10^{-5} *3*; α(M)=2.93×10^{-6} *5* α(N)=8.92×10^{-8} *13* Mult.: from (^{3}He,pnγ).
3550.9	5/2$^-$	2636.6[#]	100.0 *15*	914.2	5/2$^-$				
		3550.5[g] *13*	53.8 *15*	0.0	3/2$^-$				
3574	5/2,7/2	2175[#]	42.9 *14*	1398.8	7/2$^-$				
		2660[#]	100.0 *14*	914.2	5/2$^-$				
3578		1713[#]	97 *3*	1864.8	7/2$^-$				
		2664[#]	97 *3*	914.2	5/2$^-$				
		3578[#]	100 *3*	0.0	3/2$^-$				
3580.5	5/2$^+$	536.4[g] *11*	9[g]	3042.5	9/2$^+$	[E2]		1.46×10^{-3}	B(E2)(W.u.)=17 *10* α(K)=0.001309 *21*; α(L)=0.0001318 *21*; α(M)=1.85×10^{-5} *3* α(N)=5.49×10^{-7} *9*
		1314.0[g] *2*	68[g]	2266.5	3/2$^+$	(M1+E2)	+0.07 *5*	1.54×10^{-4}	α(K)=0.0001173 *17*; α(L)=1.153×10^{-5} *17*; α(M)=1.623×10^{-6} *23* α(N)=4.99×10^{-8} *7*; α(IPF)=2.32×10^{-5} *4* B(M1)(W.u.)=0.0013 *8*; B(E2)(W.u.)=0.007 *+11−6* Mult.: D(+Q) in (^{3}He,dγ). δ: from (^{3}He,dγ). B(M1)(W.u.) and B(E2)(W.u.) smaller than typical in this mass region. Additional information 8.
		1592.3[g] *4*	29[g]	1988.1	5/2$^{(+)}$	D+Q	−0.4 *3*		Mult.,δ: from (^{3}He,dγ).
		1714.8[g] *4*	32[g]	1864.8	7/2$^-$	[E1]		4.71×10^{-4}	α(K)=4.08×10^{-5} *6*; α(L)=3.99×10^{-6} *6*; α(M)=5.61×10^{-7} *8* α(N)=1.725×10^{-8} *25*; α(IPF)=0.000425 *6* B(E1)(W.u.)=6.E−6 *4*
		2182.3[g] *4*	41[g]	1398.8	7/2$^-$	(E1+M2)	+0.27 *20*	0.00076 *6*	α(K)=3.2×10^{-5} *6*; α(L)=3.1×10^{-6} *6*; α(M)=4.4×10^{-7} *8* α(N)=1.35×10^{-8} *25*; α(IPF)=0.00072 *7* B(E1)(W.u.)=3.3×10^{-6} *20*; B(M2)(W.u.)=0.23 *+35−22* Mult.: D+Q in (^{3}He,dγ). δ: from (^{3}He,dγ).
		2666.3[g] *2*	100[g]	914.2	5/2$^-$	(E1(+M2))	−0.13 *14*	0.00107 *4*	α(K)=2.20×10^{-5} *17*; α(L)=2.14×10^{-6} *17*;

$^{59}_{29}Cu_{30}$-22

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ †	I_γ h	E_f	J_f^π	Mult. k	δ ko	α n	Comments
									α(M)=3.01×10^{-7} *23* α(N)=9.3×10^{-9} *8*; α(IPF)=0.00105 *4* B(E1)(W.u.)=5.E−6 *3*; B(M2)(W.u.)=0.05 *+11−5* Mult.: D(+Q) from (^{3}He,dγ). δ: from (^{3}He,dγ).
3580.5	5/2$^+$	3579.9 g *3*	15 g	0.0	3/2$^-$	(E1+M2)		1.51×10^{-3} *2*	B(E1)(W.u.)≈1.3×10^{-7} *9*; B(M2)(W.u.)≈0.05 *3* α(K)=1.47×10^{-5} *3*; α(L)=1.43×10^{-6} *3*; α(M)=2.01×10^{-7} *4* α(N)=6.21×10^{-9} *11*; α(IPF)=0.001493 *23* Mult.: D+Q from (^{3}He,dγ); adopted Δπ=yes. δ=−0.32 *6* or −1.75 *21* from (^{3}He,dγ).
3615.3	3/2$^-$	3124#	100.0 *15*	491.5	1/2$^-$	(M1+E2)		0.00081 *5*	α(K)=2.60×10^{-5} *6*; α(L)=2.54×10^{-6} *6*; α(M)=3.57×10^{-7} *8* α(N)=1.102×10^{-8} *22*; α(IPF)=0.00079 *5* δ: −0.16 *10* or −2.6 *5* in (p,γ).
		3614.9 g *10*	53.8 *15*	0.0	3/2$^-$				
3699	7/2$^-$	2785#	100	914.2	5/2$^-$				
3729	3/2,5/2	1405#	100.0 *22*	2324.1	3/2$^-$				
		1741#	77.8 *22*	1988.1	5/2$^{(+)}$				
		2330#	55.6 *22*	1398.8	7/2$^-$				
3741	3/2$^-$	1753‡	25 *8*	1988.1	5/2$^{(+)}$	D+Q	−1.7 *16*		I_γ,Mult.,δ: from (^{3}He,dγ).
		2827‡	98 *10*	914.2	5/2$^-$	D			Eγ=2823 *2* in (^{3}He,pnγ) may be for this transition. Mult.: D(+Q) in (^{3}He,dγ). I_γ,δ: from (^{3}He,dγ). δ=−0.06 *17*.
		3249.4‡	100 *13*	491.5	1/2$^-$	D+Q	−0.7 *6*		I_γ,Mult.,δ: from (^{3}He,dγ).
		3741‡	28 *5*	0.0	3/2$^-$	Q(+D)	≤−0.25		I_γ,Mult.,δ: from (^{3}He,dγ).
3758	5/2$^{(+)}$,7/2,9/2$^{(-)}$	2359#	66.7 *17*	1398.8	7/2$^-$				
		2844#	100.0 *17*	914.2	5/2$^-$				
3884.7	3/2$^-$	1896.6‡	21.7 g *17*	1988.1	5/2$^{(+)}$	D			δ: δ(D,Q)=−0.02 *11* in (^{3}He,dγ).
		3393.1‡	45 g *8*	491.5	1/2$^-$	D+Q			Mult.,δ: From (^{3}He,dγ). δ=−0.13 *11* or −1.4 *3* in (^{3}He,dγ).
		3884.3‡	100 g *12*	0.0	3/2$^-$	D+Q	−0.20 *6*		Mult.,δ: from (^{3}He,dγ).
3904.0	3/2$^-$	1917.4‡	20 g *4*	1988.1	5/2$^{(+)}$	D			Mult.: from (^{3}He,dγ). δ: δ(D,Q)=−0.05 *20* in (^{3}He,dγ).
		2989.7#	31 g *7*	914.2	5/2$^-$	D			I_γ: note that I(2992γ)/I(3906γ)=1.00 *3* in (p,γ) cf. 0.31 *8* here. Mult.: From (^{3}He,dγ). δ: δ(D,Q)=−0.02 *29* in (^{3}He,dγ).

$^{59}_{29}Cu_{30}$-23

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
		3412[‡]	31[g] *7*	491.5	1/2$^-$	D+Q			Mult.: from (^{3}He,dγ). δ: δ(D,Q)=−0.04 *20* or −1.9 *8* in (^{3}He,dγ).
		3904[#]	100[g] *11*	0.0	3/2$^-$	D+Q	−0.21 *7*		Mult.,δ: from (^{3}He,dγ).

$^{59}_{29}Cu_{30}$-24

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
3930	5/2$^+$	2531.2[#]	100.0 *13*	1398.8	7/2$^-$			
		3016[#]	33.3 *13*	914.2	5/2$^-$			
4000	(1/2)$^-$	1676.1[‡]	100[g] *7*	2324.1	3/2$^-$			
		3508.8[‡]	93[g] *9*	491.5	1/2$^-$			
		3999.9[‡]	34[g] *5*	0.0	3/2$^-$			
4051	1/2$^-$,3/2$^-$	1026.2[‡]	16[g]	3024.8	5/2$^{(-)}$			Mult.: W(90°)/W(147°)=1.6 *7* in (^{3}He,dγ).
		1727.1[‡]	18[g]	2324.1	3/2$^-$			Mult.: W(90°)/W(147°)=0.8 *3* in (^{3}He,dγ).
		3559.7[‡]	45[g]	491.5	1/2$^-$			Mult.: W(90°)/W(147°)=1.8 *9* in (^{3}He,dγ).
		4050.9[‡]	100[g]	0.0	3/2$^-$			
4072	(3/2,5/2,7/2)$^{(-)}$	2084[#]	100.0 *13*	1988.1	5/2$^{(+)}$			
		3158[#]	33.3 *13*	914.2	5/2$^-$			
4100.4	(13/2$^-$)	652.9 *6*	9.8[i] *11*	3447.1	13/2$^-$	D+Q[i]		E_γ: Unweighted ave. of data from (^{3}He,pnγ) and (^{28}Si,2αpγ).
		770.8[&] *2*	100[i] *3*	3329.4	(11/2$^-$)	D+Q	+0.14 *6*	Mult.,δ: from (^{3}He,pnγ). δ is wt. ave. of +0.19 *4* (^{28}Si,2αpγ) and +0.07 *5* (^{3}He,pnγ).
		1435.5[&] *2*	50[i] *5*	2664.6	(9/2$^-$)	Q[i]		
		1513.0 *4*	4.2[i] *6*	2587.3	11/2$^-$	*i*		
		1709.6 *5*	2.2[i] *5*	2390.8	9/2$^-$	*i*		E_γ: doublet structure in (^{28}Si,2αpγ).
4108	3/2$^-$	3194[‡]	100[g] *11*	914.2	5/2$^-$	D+Q		Mult.,δ: from (^{3}He,dγ). δ=−0.3 *2* or −2.2 *10*.
		3616.7[‡]	34[g] *7*	491.5	1/2$^-$	D(+Q)	−1.0 *11*	Mult.,δ: from (^{3}He,dγ).
		4107.9[‡]	7.0[g] *28*	0.0	3/2$^-$	D,Q		Mult.,δ: from (^{3}He,dγ). δ≤+0.09 or >+2.75.
4183	5/2,9/2$^{(-)}$	1477[#]	100.0 *17*	2706.3	5/2$^-$			
		2784[#]	66.7 *17*	1398.8	7/2$^-$			
4207	5/2,7/2$^{(-)}$	1883.1[#]	93 *4*	2324.1	3/2$^-$			
		2808.2[#]	79 *4*	1398.8	7/2$^-$			
		3292.9[#]	100 *4*	914.2	5/2$^-$			
		4206.8[#]	86 *4*	0.0	3/2$^-$			
4293.9?		2895[f] *2*	100	1398.8	7/2$^-$			
4301	5/2$^{(-)}$	2902.1[‡]	100.0 *17*	1398.8	7/2$^-$	D(+Q)		Mult.,δ: from (^{3}He,dγ). δ=−0.02 *7* or −7 *3*.
		3386.7[‡]	66.7 *17*	914.2	5/2$^-$	D(+Q)		Mult.,δ: from (^{3}He,dγ). δ=−0.05 *10* or +2.0 *6*.
		4300.5[‡]	16[g] *3*	0.0	3/2$^-$	D(+Q)		Mult.,δ: from (^{3}He,dγ). δ=+0.05 *22* or ≥−2.75.
4307	5/2$^{(-)}$	3393[#p]	100	914.2	5/2$^-$			
4349	(1/2)$^-$	1219.2[#]	63 *4*	3129.9	3/2$^-$			Other Iγ: 37 in (^{3}He,dγ).
		1324.1[#]	30 *4*	3024.8	5/2$^{(-)}$			
		2025.0[#]	100 *4*	2324.1	3/2$^-$			
		2030.8[#]	33 *4*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$			

$^{59}_{29}Cu_{30}$-25

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
4349	$(1/2)^-$	2082.6[#]	63 *4*	2266.5	$3/2^+$				Other Iγ: 46 in (^{3}He,dγ).
		3857.6[#]	59 *4*	491.5	$1/2^-$				
		4348.7[#]	22 *4*	0.0	$3/2^-$				
4441	$7/2^+$	3042.2[#]	100 *2*	1398.8	$7/2^-$				
		3526.9[#]	100 *2*	914.2	$5/2^-$				
4465	$5/2^{(+)},7/2,9/2^{(-)}$	3550.9[#]	100	914.2	$5/2^-$				
4500	$(1/2)^-$	4499.8[#]	100	0.0	$3/2^-$				
4527.9	$(13/2^+)$	1198.2 *2*	11.5[i] *15*	3329.4	$(11/2^-)$	D[i]			
		1485.6[&] *2*	100[i] *5*	3042.5	$9/2^+$	Q[i]			
		1941.2 *4*	8.0[i] *20*	2587.3	$11/2^-$	D[i]			
4530	$(7/2)^+$	3615.9[#]	100	914.2	$5/2^-$				
4618		4618[#]	100	0.0	$3/2^-$				
4699	(3/2)	2375[#]	25.4 *16*	2324.1	$3/2^-$				
		4207[#]	33.3 *16*	491.5	$1/2^-$				
		4699[#]	100.0 *16*	0.0	$3/2^-$				
4774	$3/2^-,5/2^-$	1033[#]	5.6 *28*	3741	$3/2^-$				
		1337[#]	11 *3*	3438	(1/2)	D(+Q)			δ: −0.04 *5* or −1.6 *3* in (p,γ).
		1644[#]	5.6 *28*	3129.9	$3/2^-$				
		1846[#]	5.6 *28*	2928	$5/2^{(-)}$				
		2059[#]	2.8 *28*	2715.3	$7/2^-$				
		2068[#]	5.6 *28*	2706.3	$5/2^-$				
		2455[#]	19 *3*	2318.5	$1/2^{(-)},5/2^{(-)}$	D+Q			δ: −0.11 *5* or −1.38 *20* in (p,γ).
		2507[#p]	22 *3*	2266.5	$3/2^+$	(E1)		9.91×10^{-4}	B(E1)(W.u.)=0.00064 *11* α(K)=2.33×10^{-5} *4*; α(L)=2.28×10^{-6} *4*; α(M)=3.20×10^{-7} *5* α(N)=9.87×10^{-9} *14*; α(IPF)=0.000965 *14* δ: +0.02 *5* in (p,γ).
		2786[#] *10*	31 *3*	1988.1	$5/2^{(+)}$	(M1+E2)	−0.34 *15*	6.42×10^{-4} *13*	α(K)=3.09×10^{-5} *5*; α(L)=3.02×10^{-6} *5*; α(M)=4.25×10^{-7} *7* α(N)=1.312×10^{-8} *21*; α(IPF)=0.000608 *13* B(M1)(W.u.)=0.029 *5*; B(E2)(W.u.)=0.8 *7*
		2909[#]	8.3 *28*	1864.8	$7/2^-$	[E2]		7.74×10^{-4}	B(E2)(W.u.)=1.7 *6* α(K)=2.96×10^{-5} *5*; α(L)=2.89×10^{-6} *4*; α(M)=4.07×10^{-7} *6* α(N)=1.254×10^{-8} *18*; α(IPF)=0.000741 *11*
		3860[#p]	53 *3*	914.2	$5/2^-$	(M1+E2)	+0.54 *11*	1.06×10^{-3} *2*	α(K)=1.85×10^{-5} *3*; α(L)=1.81×10^{-6} *3*;

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
									α(M)=2.54×10^{-7} *4* α(N)=7.85×10^{-9} *12*; α(IPF)=0.001040 *17* B(M1)(W.u.)=0.0161 *23*; B(E2)(W.u.)=0.60 *20*
4774	3/2$^-$,5/2$^-$	4282#p *10*	100 *3*	491.5	1/2$^-$	(M1+E2)		0.00123 *6*	B(M1)(W.u.)=0.0145 *15*; B(E2)(W.u.)=1.49 *15* α(K)=1.60×10^{-5} *4*; α(L)=1.56×10^{-6} *4*; α(M)=2.19×10^{-7} *5* α(N)=6.77×10^{-9} *14*; α(IPF)=0.00121 *6* δ: −0.29 *5* or −0.96 *9* in (p,γ).
		4773#	8.3 *28*	0.0	3/2$^-$				
4818	3/2$^-$	1384#	1.8 *18*	3434	5/2	D(+Q)			δ: +0.05 *8* or −6 *2* in (p,γ).
		2494.1#	5.5 *18*	2324.1	3/2$^-$	D			δ(D,Q)=+0.07 *9* from (p,γ).
		2551.6#p	3.6 *18*	2266.5	3/2$^+$	D			δ(D,Q)=−0.04 *6* from (p,γ).
		2830.1#	12.7 *18*	1988.1	5/2$^{(+)}$	D+Q	+0.07 *2*		
		3903.9#p	9.1 *18*	914.2	5/2$^-$	D+Q	+0.22 *3*		
		4326.7#p *10*	100.0 *18*	491.5	1/2$^-$	D+Q			δ: +0.06 *1* or −2.02 *7* in (p,γ).
		4817.8#p *9*	49.1 *18*	0.0	3/2$^-$	D(+Q)			δ: +0.056 *17* or +3.4 *4* in (p,γ).
4904.0	(15/2$^-$)	802.7 *2*	100.0[i] *23*	4100.4	(13/2$^-$)	D+Q[i]	+0.23 *6*		Mult.,δ: From (^{3}He,pnγ). Wt. ave. of +0.18 *+5−6* (^{28}Si,2αpγ) and +0.31 *6* (^{3}He,pnγ).
		1457.3 *3*	12.6[i] *9*	3447.1	13/2$^-$	D+Q[i]	−0.21 *+8−11*		E_γ: Doublet (see comment in (^{28}Si,2αpγ)).
		1574.7& *2*	86[i] *5*	3329.4	(11/2$^-$)	Q[i]			
		2316.7#	16.3[i] *19*	2587.3	11/2$^-$	Q[i]			
4914.6	5/2$^{(+)}$,7/2,9/2$^{(-)}$	4000#	100	914.2	5/2$^-$				
5053.2	(5/2)$^-$	1938.8#	25 *3*	3114.4	5/2$^-$				
		2337.9#	19 *3*	2715.3	7/2$^-$				
		2346.9#	8.3 *28*	2706.3	5/2$^-$				
		3065.0#	100 *3*	1988.1	5/2$^{(+)}$				
		4138.8#	42 *3*	914.2	5/2$^-$				
		5052.7#	83 *3*	0.0	3/2$^-$				
5105.3	(1/2$^-$,3/2,5/2$^-$)	4190.9#		914.2	5/2$^-$				
		4613.6#		491.5	1/2$^-$				
		5104.8#		0.0	3/2$^-$				
5220.3	9/2	1911.3#	≈6.9	3309	7/2$^{(-)}$				
		2177.8#	6.0	3042.5	9/2$^+$				
		2504.9#	2.8	2715.3	7/2$^-$				
		2555.6#	3.0	2664.6	(9/2$^-$)				
		3355.4#	16.6	1864.8	7/2$^-$				
		3821.4#	100	1398.8	7/2$^-$	D			δ(D,Q)=0.00 *2* from (p,γ).

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [h]	E_f	J_f^π	Mult. [k]	δ [ko]	α [n]	Comments
5230.6	1/2⁻	1792.6#	1.2 *12*	3438	(1/2)				
		2205.8#	1.2 *12*	3024.8	5/2$^{(-)}$				
		2964.0#	7.0 *12*	2266.5	3/2$^+$				
		4738.9#	7.0 *12*	491.5	1/2⁻				
		5230.1#	100.0 *12*	0.0	3/2⁻	D			
5255.0?		5254.8#[p]	100	0.0	3/2⁻				
5264	3/2⁻	1360.0#	9	3904.0	3/2⁻	(M1(+E2))		1.65×10^{-4} *12*	α(K)=0.000115 *6*; α(L)=1.13×10^{-5} *6*; α(M)=1.59×10^{-6} *8* α(N)=4.89×10^{-8} *23*; α(IPF)=3.7×10^{-5} *6* δ: −0.02 *8* or +4.1 *20* in (p,γ).
		1649#	<3	3615.3	3/2⁻				
		1827#	3	3438	(1/2)				
		1830#	3	3434	5/2				
		2149.9#	34 *9*	3114.4	5/2⁻	(M1+E2)	+0.10 *8*	3.75×10^{-4}	α(K)=4.77×10^{-5} *7*; α(L)=4.67×10^{-6} *7*; α(M)=6.57×10^{-7} *10* α(N)=2.03×10^{-8} *3*; α(IPF)=0.000322 *5*
		2335.8#	20 *9*	2928	5/2$^{(-)}$	D			δ(D,Q)=+0.03 *8* from (p,γ).
		2558#	20 *9*	2706.3	5/2⁻	D(+Q)	+0.09 *11*		
		2940#	20 *9*	2324.1	3/2⁻				
		2945.8#	11 *9*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$				
		2997.6#	<3	2266.5	3/2$^+$				
		3276.1#	3	1988.1	5/2$^{(+)}$				
		4349.9#	11 *9*	914.2	5/2⁻				
		4772.7#	51 *9*	491.5	1/2⁻	(M1+E2)		0.00138 *7*	α(K)=1.36×10^{-5} *3*; α(L)=1.33×10^{-6} *3*; α(M)=1.87×10^{-7} *4* α(N)=5.77×10^{-9} *12*; α(IPF)=0.00137 *6* δ: −0.11 *8* or −2.3 *6* in (p,γ).
		5263.8#	100 *9*	0.0	3/2⁻	(M1+E2)	+0.18 *9*	1.46×10^{-3}	α(K)=1.168×10^{-5} *17*; α(L)=1.138×10^{-6} *16*; α(M)=1.601×10^{-7} *23* α(N)=4.95×10^{-9} *7*; α(IPF)=0.001448 *21*
5306	(1/2)⁻	1402#	3.0	3904.0	3/2⁻				
		1691#	3.0	3615.3	3/2⁻				
		1867#	6 *4*	3438	(1/2)				
		2176.3#	15 *5*	3129.9	3/2⁻				
		2281.2#	11 *5*	3024.8	5/2$^{(-)}$				
		2982#	100 *5*	2324.1	3/2⁻				

$^{59}_{29}Cu_{30}$-28

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	Comments
5306	$(1/2)^-$	5305.7[#]	14 *4*	0.0	$3/2^-$		
5427.0	$(17/2^+)$	523.0 *1*	40.9[i] *14*	4904.0	$(15/2^-)$	*i*	
		899.1 *4*	100[i] *5*	4527.9	$(13/2^+)$	Q	E_γ: Unweighted average of data from (^{3}He,pnγ) and (^{28}Si,2αpγ).
5442	$(3/2)^+$	2417[#]	13.0 *20*	3024.8	$5/2^{(-)}$		
		2514[#]	43 *6*	2928	$5/2^{(-)}$		
		2727[#]	8.7 *13*	2715.3	$7/2^-$		
		2736[#]	8.7 *13*	2706.3	$5/2^-$		
		3118[#]	52 *8*	2324.1	$3/2^-$		
		3175[#]	22 *3*	2266.5	$3/2^+$		
		3454[#]	100 *15*	1988.1	$5/2^{(+)}$		
		4528[#]	61 *9*	914.2	$5/2^-$		
		4950[#]	78 *12*	491.5	$1/2^-$		
		5441[#]	48 *7*	0.0	$3/2^-$		
5473		5472[#]		0.0	$3/2^-$		
5482	$(5/2^-)$	1901[#]	13.3 *20*	3578			
		2368[#]	16.7 *25*	3114.4	$5/2^-$		
		2439[#]	10.0 *15*	3042.5	$9/2^+$		
		2457[#]	16.7 *25*	3024.8	$5/2^{(-)}$		
		3158[#]	50 *8*	2324.1	$3/2^-$		
		3215[#]	53 *8*	2266.5	$3/2^+$		
		3494[#]	20 *3*	1988.1	$5/2^{(+)}$		
		3617[#]	30 *5*	1864.8	$7/2^-$		
		4083[#]	10.0 *15*	1398.8	$7/2^-$		
		4568[#]	13.3 *20*	914.2	$5/2^-$		
		4990[#]	100 *15*	491.5	$1/2^-$		
5521	$3/2^-$,5/2	2806[#]	1.1 *11*	2715.3	$7/2^-$		
		4122[#]	4.5 *11*	1398.8	$7/2^-$		
		4607[#]	6.7 *11*	914.2	$5/2^-$		
		5520[#]	100.0 *11*	0.0	$3/2^-$	D(+Q)	
5550	(3/2,5/2)	1809[#]	8.1 *27*	3741	$3/2^-$		
		1935[#]	13.5 *27*	3615.3	$3/2^-$		
		2113[#]	8.1 *27*	3438	(1/2)		
		2116[#]	2.7 *27*	3434	5/2		
		2436[#]	10.8 *27*	3114.4	$5/2^-$		
		2622[#]	18.9 *27*	2928	$5/2^{(-)}$		

$^{59}_{29}Cu_{30}$-29

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
5550	(3/2,5/2)	3283[#]	45.9 *27*	2266.5	$3/2^+$			
		3685[#]	62.2 *27*	1864.8	$7/2^-$	D+Q	−0.11 *+7−6*	
		5549[#]	100.0 *27*	0.0	$3/2^-$	D+Q		
5602	(3/2)	2577[#]	26.0 *20*	3024.8	$5/2^{(-)}$			
		3283[#]	20.0 *20*	2318.5	$1/2^{(-)},5/2^{(-)}$			
		3335[#]	22.0 *20*	2266.5	$3/2^+$			
		4688[#]	6.0 *20*	914.2	$5/2^-$			
		5110[#]	26.0 *20*	491.5	$1/2^-$			
		5601[#]	100.0 *20*	0.0	$3/2^-$			
5620	$7/2^{(-)}$	1437[#]	23 *6*	4183	$5/2,9/2^{(-)}$			
		2577[#]	6 *6*	3042.5	$9/2^+$	D		δ(D,Q)=+0.05 *20* from (p,γ).
		2692[#]	2	2928	$5/2^{(-)}$			
		2905[#]	4	2715.3	$7/2^-$			
		2914[#]	23 *6*	2706.3	$5/2^-$			
		2955[#]	40 *6*	2664.6	$(9/2^-)$			
		3632[#]	9 *6*	1988.1	$5/2^{(+)}$			
		4221[#]	4	1398.8	$7/2^-$	D+Q	+0.78 *10*	
		5619[#]	100 *6*	0.0	$3/2^-$			
5642	$(3/2)^-$	1943[#]	7 *3*	3699	$7/2^-$			
		2528[#]	10 *3*	3114.4	$5/2^-$			
		2650[#]	23 *3*	2992.0	$3/2,5/2^-,7/2^-$			
		3318[#]	10 *3*	2324.1	$3/2^-$			
		3323[#]	23 *3*	2318.5	$1/2^{(-)},5/2^{(-)}$			
		3375[#]	33 *3*	2266.5	$3/2^+$			
		3654[#]	7 *3*	1988.1	$5/2^{(+)}$			
		3777[#]	7 *3*	1864.8	$7/2^-$			
		4243[#]	13 *3*	1398.8	$7/2^-$			
		4728[#]	60 *3*	914.2	$5/2^-$	D+Q	−0.16 *+12−14*	
		5150[#]	40 *3*	491.5	$1/2^-$	D+Q	+0.15 *+7−9*	
		5641[#]	100 *3*	0.0	$3/2^-$	D+Q	−0.10 *+5−6*	
5658	$5/2^-$	2043[#]	3.8 *8*	3615.3	$3/2^-$	D		δ(D,Q)=−0.05 *12* from (p,γ).
		2077[#]	7.0 *23*	3578				
		2107[#]	2.3 *23*	3550.9	$5/2^-$			
		2633[#]	2.3 *23*	3024.8	$5/2^{(-)}$			
		2730[#]	4.7 *23*	2928	$5/2^{(-)}$			

$^{59}_{29}Cu_{30}$-30

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
5658	5/2$^-$	2943[#]	27.9 *23*	2715.3	7/2$^-$	D+Q	−0.10 *5*	
		3339[#]	7.0 *23*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$			
		3391[#]	18.6 *23*	2266.5	3/2$^+$	D(+Q)	+0.05 *4*	
		3670[#]	11.6 *23*	1988.1	5/2$^{(+)}$	D		δ(D,Q)=0.00 *10* from (p,γ).
		3793[#]	7.0 *23*	1864.8	7/2$^-$	D		δ: −0.05 *10* for (D,Q) in (p,γ).
		4259[#]	100.0 *23*	1398.8	7/2$^-$	D		δ: −0.01 *3* in (p,γ).
		4744[#]	30.2 *23*	914.2	5/2$^-$	D+Q	+0.27 *13*	
5694		5693[#]		0.0	3/2$^-$			
5712	5/2$^-$	1971[#]	3.6 *18*	3741	3/2$^-$			
		2134[#]	10.7 *18*	3578				
		2278[#]	7.1 *18*	3434	5/2			
		2598[#]	7.1 *18*	3114.4	5/2$^-$			
		2997[#]	7.1 *18*	2715.3	7/2$^-$			
		3445[#]	12.5 *18*	2266.5	3/2$^+$			
		4313[#]	17.9 *18*	1398.8	7/2$^-$			
		4797[#]	12.5 *18*	914.2	5/2$^-$			
		5711[#]	100.0 *18*	0.0	3/2$^-$			
5721.8	3/2,5/2$^{(-)}$	2696.9[#]	14 *3*	3024.8	5/2$^{(-)}$			
		2793.7[#]	20 *3*	2928	5/2$^{(-)}$			
		3397.6[#]	63 *3*	2324.1	3/2$^-$			
		3403.2[#]	43 *3*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$			
		3733.6[#]	100 *3*	1988.1	5/2$^{(+)}$			
		5230.0[#]	9 *3*	491.5	1/2$^-$			
		5721.2[#]	37 *3*	0.0	3/2$^-$			
5722.2	(17/2$^-$)	818.1 *2*	77.5 *25*	4904.0	(15/2$^-$)	D+Q[i]	+0.15 *+4−5*	I_γ: Other: 33 (^{3}He,pnγ).
		1621.6 *3*	100[i] *5*	4100.4	(13/2$^-$)	Q[i]		
		2275.8[e] *5*	17.5[i] *13*	3447.1	13/2$^-$	Q[i]		
5777.5		5776.9[#]	100	0.0	3/2$^-$			
5833		5832[#]	100	0.0	3/2$^-$			
5851	5/2$^-$	5850[#]		0.0	3/2$^-$			
5881	3/2$^-$,5/2$^-$	2182[#]	1.4 *14*	3699	7/2$^-$			
		3166[#]	4.3 *14*	2715.3	7/2$^-$			
		3562[#]	18.6 *14*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$			
		3893[#]	5.7 *14*	1988.1	5/2$^{(+)}$			
		4967[#]	8.6 *14*	914.2	5/2$^-$			

$^{59}_{29}Cu_{30}$-31

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
5881	3/2$^-$,5/2$^-$	5880[#]	100.0 *14*	0.0	3/2$^-$			δ(D,Q)=−0.45 *9* if J(5881 level)=3/2, from (p,γ).
5897	7/2$^{(-)}$	2783[#]	6.8 *11*	3114.4	5/2$^-$	D		δ(D,Q)=−0.1 *11* from (p,γ).
		3909[#]	6.8 *11*	1988.1	5/2$^{(+)}$	D+Q	−2.5 *11*	
		4498[#]	100.0 *11*	1398.8	7/2$^-$	D(+Q)	−0.07 *10*	
5914	5/2	2889[#]	100	3024.8	5/2$^{(-)}$	D		
5928	5/2	5927[#]		0.0	3/2$^-$			
5941	3/2,5/2	3622[#]		2318.5	1/2$^{(-)}$,5/2$^{(-)}$			
		3674[#]		2266.5	3/2$^+$			
		5940[#]		0.0	3/2$^-$	D+Q		δ: −0.77 *12* if J(5941 level)=3/2·ln(p,γ).
5957		5956[#]		0.0	3/2$^-$			
5968		4569[#p]		1398.8	7/2$^-$			
		5054[#p]		914.2	5/2$^-$			
		5967[#p]		0.0	3/2$^-$			
5971		4572[#p]		1398.8	7/2$^-$			
		5057[#p]		914.2	5/2$^-$			
		5970[#p]		0.0	3/2$^-$			
6039	(3/2$^+$)	2340[#]	2.2 *22*	3699	7/2$^-$			
		2461[#]	8.7 *22*	3578		D+Q		δ: +0.65 *22* or +4 *2* in (p,γ).
		2488[#]	<2.2	3550.9	5/2$^-$			
		3111[#]	4.3 *22*	2928	5/2$^{(-)}$			
		3324[#]	4.3 *22*	2715.3	7/2$^-$			
		3715[#]	19.6 *22*	2324.1	3/2$^-$	D,Q		δ: +0.03 *11* or <−3 in (p,γ).
		3772[#]	15.2 *22*	2266.5	3/2$^+$	D+Q	−1.5 *7*	
		4051[#]	17.4 *22*	1988.1	5/2$^{(+)}$	D+Q	−1.0 *7*	
		5125[#]	19.6 *22*	914.2	5/2$^-$	D,Q		δ: +0.06 *11* or <−4 in (p,γ).
		5547[#]	26.1 *22*	491.5	1/2$^-$	D(+Q)		δ: −0.05 *8* or −1.5 *3* in (p,γ).
		6038[#]	100.0 *22*	0.0	3/2$^-$	Q(+D)		δ: −0.17 *4* or <−10 in (p,γ).
6049.8	(17/2$^-$)	1145.5 *2*	100 *6*	4904.0	(15/2$^-$)	D+Q		δ: +4.1 *+16−8* or +0.32 *6*.
		1949.1 *4*	93 *5*	4100.4	(13/2$^-$)	Q		
		2605 *1*	21 *4*	3447.1	13/2$^-$	Q		
6076	3/2	5584[#]		491.5	1/2$^-$	D+Q	−0.10 *8*	
6091	(3/2)	2513[#]	1.4 *14*	3578				
		3066[#]	4.3 *14*	3024.8	5/2$^{(-)}$			
		3767[#]	15.7 *14*	2324.1	3/2$^-$	D+Q		δ: −0.5 *1* or −6 *2*.
		5599[#]	21.4 *14*	491.5	1/2$^-$	Q(+D)		δ: −0.4 *2* or <−3.
		6090[#]	100.0 *14*	0.0	3/2$^-$	Q(+D)		δ: −0.29 *4* or <−14.

$^{59}_{29}Cu_{30}$-32

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
6125	3/2$^-$,5/2$^-$	5633[#]		491.5	1/2$^-$	D(+Q)		
		6124[#]		0.0	3/2$^-$			
6174.9	(15/2$^+$)	2074.2[d] *4*	100	4100.4	(13/2$^-$)	D[i]		
6197	(3/2)	2619[#]	56.4 *26*	3578				
		3482[#]	20.5 *26*	2715.3	7/2$^-$			
		3873[#]	59.0 *26*	2324.1	3/2$^-$			
		3930[#]	20.5 *26*	2266.5	3/2$^+$			
		5706[#]	100.0 *26*	491.5	1/2$^-$			
6201	3/2,5/2	2763[#]	29 *5*	3438	(1/2)			
		3087[#]	62 *5*	3114.4	5/2$^-$			
		3176[#]	24 *5*	3024.8	5/2$^{(-)}$			
		3273[#]	19 *5*	2928	5/2$^{(-)}$			
		3495[#]	19 *5*	2706.3	5/2$^-$			
		3877[#]	86 *5*	2324.1	3/2$^-$			
		3934[#]	24 *5*	2266.5	3/2$^+$			
		4213[#]	100 *5*	1988.1	5/2$^{(+)}$	D		δ(D,Q)=−0.02 *+9−4*.
		5287[#]	29 *5*	914.2	5/2$^-$			
		5710[#]	62 *5*	491.5	1/2$^-$	D(+Q)		
		6200[#]	24 *5*	0.0	3/2$^-$	D(+Q)		
6206	9/2$^+$	3092[#]	3.6 *12*	3114.4	5/2$^-$			
		3163[#]	100.0 *12*	3042.5	9/2$^+$	D(+Q)	+0.3 *4*	
		3491[#]	3.6 *12*	2715.3	7/2$^-$			
		3619[#]	7.1 *12*	2587.3	11/2$^-$	D		δ(D,Q)=−0.10 *15*.
		4218[#]	4.8 *12*	1988.1	5/2$^{(+)}$	Q		
6238	3/2$^-$	2660[#]	26 *3*	3578				
		3213[#]	12 *3*	3024.8	5/2$^{(-)}$			
		3971[#]	21 *3*	2266.5	3/2$^+$			
		4250[#]	12 *3*	1988.1	5/2$^{(+)}$			
		4839[#]	41 *3*	1398.8	7/2$^-$			
		5746[#]	82 *3*	491.5	1/2$^-$			δ(D,Q)=+0.02 *4* from (p,γ).
		6237[#]	100 *3*	0.0	3/2$^-$	D+Q		
6300	(3/2$^-$,5/2$^-$)	2685[#]	9 *5*	3615.3	3/2$^-$			
		3186[#]	36 *5*	3114.4	5/2$^-$	Q(+D)		δ: +0.33 *20* or δ>8 in (p,γ).
		3372[#]	91 *5*	2928	5/2$^{(-)}$	Q(+D)		δ: +0.18 *9* or δ>8 in (p,γ).
		3585[#]	23 *5*	2715.3	7/2$^-$			

$^{59}_{29}Cu_{30}$-33

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
6300	(3/2$^-$,5/2$^-$)	3594[#]	9 *5*	2706.3	5/2$^-$			
		3981[#]	23 *5*	2324.1	3/2$^-$			
		4033[#]	18 *5*	2266.5	3/2$^+$	Q(+D)		δ: −0.35 *+17−23* or δ>4 in (p,γ).
		4312[#]	82 *5*	1988.1	5/2$^{(+)}$	Q(+D)		δ: +0.28 *11* or δ>10 in (p,γ).
		4435[#]	23 *5*	1864.8	7/2$^-$			
		5808[#]	100 *5*	491.5	1/2$^-$	D(+Q)		δ: −0.09 *7* or −1.43 *10* in (p,γ).
		6299[#]	41 *5*	0.0	3/2$^-$	D(+Q)		δ: −0.19 *5* or −16 *−7+54* in (p,γ).
6323.9	(5/2)	3608.5[#]	11.1 *22*	2715.3	7/2$^-$			
		4005.3[#]	24.4 *22*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$			
		4057.3[#]	8.9 *22*	2266.5	3/2$^+$			
		4458.9[#]	100.0 *22*	1864.8	7/2$^-$			
		4924.9[#]	20.0 *22*	1398.8	7/2$^-$			
		5409.4[#]	11.1 *22*	914.2	5/2$^-$	D		δ(D,Q)=0.002 from (p,γ).
		5832.1[#]	28.9 *22*	491.5	1/2$^-$			
		6323.2[#]	17.8 *22*	0.0	3/2$^-$			
6326	(3/2$^-$)	4007[#]	9.2 *15*	2324.1	3/2$^-$			
		4059[#]	18.5 *15*	2266.5	3/2$^+$			
		4461[#]	18.5 *15*	1864.8	7/2$^-$			
		5834[#]	7.7 *15*	491.5	1/2$^-$			
		6325[#]	100.0 *15*	0.0	3/2$^-$			E_γ: in (p,γ), E(level)=6327.4 *6* based on possible doublet with γ from level 4 keV below.
6344.2	(3/2$^-$,5/2$^-$)	2645.1[#]	<2.2	3699	7/2$^-$			
		2763.6[#]	6.5 *22*	3578				
		2793.3[#]	17.4 *22*	3550.9	5/2$^-$			
		3319.3[#]	2.2 *22*	3024.8	5/2$^{(-)}$			
		3352.1[#]	6.5 *22*	2992.0	3/2,5/2$^-$,7/2$^-$			
		3628.8[#]	15.2 *22*	2715.3	7/2$^-$			
		4077.6[#]	39.1 *22*	2266.5	3/2$^+$	D+Q		Mult.,δ: from (p,γ). δ(D,Q)=−0.4 *+2−3* if J(6344 level)=3/2.
		5429.7[#]	100.0 *22*	914.2	5/2$^-$	D+Q		Mult.,δ: from (p,γ). δ(D,Q)=+0.34 *+14−11* if J(6344 level)=3/2.
		5852.4[#]	15.2 *22*	491.5	1/2$^-$	D		Mult.,δ: from (p,γ). δ(D,Q)=−0.06 *+14−21* if J(6344 level)=3/2.
		6343.5[#]	15.2 *22*	0.0	3/2$^-$	D+Q		Mult.,δ: from (p,γ). δ(D,Q)=−0.8 *+4−5* if J(6344 level)=3/2.
6365.5	3/2$^-$	2787.4[#]	20.0 *25*	3578				
		3659.1[#]	7.5 *25*	2706.3	5/2$^-$			
		5451.0[#]	35.0 *25*	914.2	5/2$^-$	D+Q	+0.11 *6*	
		5873.7[#]	100.0 *25*	491.5	1/2$^-$	D+Q		

$^{59}_{29}Cu_{30}$-34

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
6365.5	3/2$^-$	6364.8[#]	87.5 *25*	0.0	3/2$^-$	D+Q	−0.14 *7*	
6410		4422[#]		1988.1	5/2$^{(+)}$			δ(D,Q)=+0.20 *14* if J(6410 level)=3/2.
		6409[#]		0.0	3/2$^-$			δ(D,Q)=−0.61 *9* if J(6410 level)=3/2.
6419	3/2$^{(-)}$	4095[#]	83	2324.1	3/2$^-$	D+Q	−0.45 *+19−27*	
		4152[#]	100	2266.5	3/2$^+$	D+Q	−0.5 *+2−5*	
		5505[#]	83	914.2	5/2$^-$	D(+Q)	−0.15 *10*	
		5927[#]	86	491.5	1/2$^-$	D(+Q)	+0.04 *5*	
		6418[#][p]	79	0.0	3/2$^-$			
6451		6450[#]		0.0	3/2$^-$			
6457	5/2	2156[#]	14.1 *26*	4301	5/2$^{(-)}$	D+Q	−0.3 *2*	
		2758[#]	12.1 *26*	3699	7/2$^-$	D+Q	−1.4 *12*	
		2883[#]	17.2 *26*	3574	5/2,7/2	D+Q		
		2906[#]	3.8 *26*	3550.9	5/2$^-$			
		3019[#]	3.1 *26*	3438	(1/2)			
		3023[#]	4.4 *26*	3434	5/2			
		3327[#]	3.6 *26*	3129.9	3/2$^-$			
		3343[#]	4.4 *26*	3114.4	5/2$^-$			
		3465[#]	6.9 *26*	2992.0	3/2,5/2$^-$,7/2$^-$	D,Q		δ: +0.2 *2* or <−6 from (p,γ).
		3529[#]	2.8 *26*	2928	5/2$^{(-)}$			
		3751[#]	30.5 *26*	2706.3	5/2$^-$	D(+Q)		δ: 0.0 *1* or −1.3 *3* from (p,γ).
		4133[#]	15.9 *26*	2324.1	3/2$^-$	D+Q	−0.2 *1*	
		4469[#]	9.7 *26*	1988.1	5/2$^{(+)}$			
		5058[#]	11.3 *26*	1398.8	7/2$^-$	Q(+D)	>+0.27	
		5543[#]	100.0 *26*	914.2	5/2$^-$	D(+Q)	−0.09 *12*	
		6456[#]	16.7 *26*	0.0	3/2$^-$			
6461	3/2$^{(-)}$	2883[#]	18 *4*	3578		D+Q		δ: +0.4 *2* or +11 *8*.
		3331[#]	29 *4*	3129.9	3/2$^-$	D,Q		δ(D,Q)=0.0 *1* or <−3.
		3436[#]	12 *4*	3024.8	5/2$^{(-)}$	Q,D		δ: +0.2 *2* or <−5.
		3755[#]	27 *4*	2706.3	5/2$^-$			
		4137[#]	46 *4*	2324.1	3/2$^-$	D(+Q)		δ: −0.2 *11* or +2.4 *9*.
		4142[#]	49 *4*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$	D+Q		δ(D,Q)=−0.3 *1* or −0.9 *1*.
		4194[#]	22 *4*	2266.5	3/2$^+$	D+Q	−0.4 *1*	
		4473[#]	10 *4*	1988.1	5/2$^{(+)}$			
		5547[#]	100 *4*	914.2	5/2$^-$	D(+Q)		δ: −0.05 *14* or −4.7 *25* from (p,γ).
		5969[#]	53 *4*	491.5	1/2$^-$	D+Q	−0.6 *2*	

$^{59}_{29}Cu_{30}$-35

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
6461	$3/2^{(-)}$	6460.6[#]	18 *4*	0.0	$3/2^-$			
6470	$3/2,5/2^{(-)}$	3764[#]		2706.3	$5/2^-$			δ(D,Q)=+0.19 *23* if J(6470 level)=3/2 in (p,γ).
		4151[#]		2318.5	$1/2^{(-)},5/2^{(-)}$			
		4203[#]		2266.5	$3/2^+$			
		5556[#]		914.2	$5/2^-$			δ(D,Q)=+0.45 *9* if J(6470 level)=3/2 in (p,γ).
		5978[#]		491.5	$1/2^-$			δ(D,Q)=−0.16 *9* if J(6470 level)=3/2 in (p,γ).
6493	$7/2^{(-)}$	2186[#]	8 *6*	4307	$5/2^{(-)}$	D		δ(D,Q)=+0.1 *1* from (p,γ).
		2192[#]	7 *6*	4301	$5/2^{(-)}$	D(+Q)		
		2286[#]	30 *6*	4207	$5/2,7/2^{(-)}$	D(+Q)		
		2310[#]	24 *6*	4183	$5/2,9/2^{(-)}$	D(+Q)		
		2421[#]	14 *6*	4072	$(3/2,5/2,7/2)^{(-)}$			
		2563[#]	8 *6*	3930	$5/2^+$			
		2589[#]	7 *6*	3904.0	$3/2^-$			
		2608[#]	11 *6*	3884.7	$3/2^-$			
		2794[#]	23 *6*	3699	$7/2^-$	D+Q	−0.5 *2*	
		2919[#]	27 *6*	3574	5/2,7/2	D+Q		
		2942[#]	12 *6*	3550.9	$5/2^-$			
		3059[#]	40 *6*	3434	5/2	D		δ(D,Q)=0.00 *4* in (p,γ).
		3184[#]	90 *6*	3309	$7/2^{(-)}$	D+Q	−0.16 *6*	
		3378[#]	9 *6*	3114.4	$5/2^-$	D		δ(D,Q)=0.0 *2* in (p,γ).
		3450[#]	11 *6*	3042.5	$9/2^+$	D		δ(D,Q)=+0.05 *16* in (p,γ).
		3565[#]	45 *6*	2928	$5/2^{(-)}$	D+Q	−0.9 *2*	
		3778[#]	100 *6*	2715.3	$7/2^-$	D		δ(D,Q)=−0.05 *11* in (p,γ).
		3787[#]	39 *6*	2706.3	$5/2^-$	D		δ(D,Q)=−0.03 *5* in (p,γ).
		3828[#]	14 *6*	2664.6	$(9/2^-)$	D+Q		
		4505[#]	2 *6*	1988.1	$5/2^{(+)}$			
		4628[#]	55 *6*	1864.8	$7/2^-$	D+Q	−0.15 *8*	
		5094[#]	29 *6*	1398.8	$7/2^-$	D		δ(D,Q)=−0.1 *1* in (p,γ).
		5579[#]	16 *6*	914.2	$5/2^-$			
6530.2	$(3/2^-)$	6529.5[#]		0.0	$3/2^-$			
6559		6558[#]		0.0	$3/2^-$			
6610.6	$(19/2^-)$	888.1 *2*	69.6[i] *22*	5722.2	$(17/2^-)$	D+Q[i]	+0.16 *+4−5*	
		1707.4 *3*	100[i] *4*	4904.0	$(15/2^-)$	Q[i]		
6625.5	$3/2^{(+)}$	3047.4[#]	6.5 *13*	3578		D		δ(D,Q)=+0.2 *1* from (p,γ).
		3191.4[#]	8.3 *13*	3434	5/2			

$^{59}_{29}Cu_{30}$-36

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ †	I_γ h	E_f	J_f^π	Mult. k	δ ko	Comments
6625.5	3/2(+)	3697.4#	2.7 *13*	2928	5/2(−)			
		4301.2#	6.3 *13*	2324.1	3/2−			
		4306.8#	7.0 *13*	2318.5	1/2(−),5/2(−)			
		6133.7#	5.3 *13*	491.5	1/2−			
		6624.8#	100.0 *13*	0.0	3/2−	D(+Q)		δ: −0.03 *3* or >−3.6 from (p,γ).
6645.5	(3/2−)	6644.8#		0.0	3/2−			
6662		6661.3#		0.0	3/2−			
6690.4	(17/2+)	515.4 *2*	15.8 i *25*	6174.9	(15/2+)	D+Q i m		
		1263.4 *3*	17.5 *25*	5427.0	(17/2+)			
		1788.1 *4*	100 i *4*	4904.0	(15/2−)	D+Q i	−0.05 *1*	
6692		6691.3#		0.0	3/2−			
6710	3/2(−)	3272#	5.5 *20*	3438	(1/2)			
		3580#	5.1 *20*	3129.9	3/2−			
		3782#	5.5 *20*	2928	5/2(−)			
		4386#	3.5 *20*	2324.1	3/2−			
		4391#	2.0 *20*	2318.5	1/2(−),5/2(−)			
		4443#	6.9 *20*	2266.5	3/2+			
		6218#	100.0 *20*	491.5	1/2−	D+Q		δ: −0.16 *4* or −1.1 *1*.
		6709#	75.5 *20*	0.0	3/2−	D+Q		δ: −0.02 *3* or −4 *1*.
6727	(3/2−,5/2−)	2823#	2.4 *13*	3904.0	3/2−			
		2842#	2.9 *13*	3884.7	3/2−			
		3149#	5.1 *13*	3578				
		4012#	3.5 *13*	2715.3	7/2−			
		4403#	4.1 *13*	2324.1	3/2−			
		5328#	3.1 *13*	1398.8	7/2−			
		6235#	100.0 *13*	491.5	1/2−			
		6726#		0.0	3/2−			
6749	5/2(+)	2864#	2.6 *11*	3884.7	3/2−	D		δ(D,Q)=+0.1 *1* if J(3887 level)=3/2.
		3175#	2.6 *11*	3574	5/2,7/2	D+Q	+2 *1*	
		4430#	3.3 *11*	2318.5	1/2(−),5/2(−)	D(+Q)		E_γ: see comment in (p,γ). δ: −0.04 *14* or −1.8 *4*.
		5350#	4.8 *11*	1398.8	7/2−	D+Q	+0.05 *2*	
		6748#	100.0 *11*	0.0	3/2−	D+Q	+0.21 *3*	
6750.0	(17/2+)	1322.9 *4*	100	5427.0	(17/2+)	m		
6760	(3/2−)	4772#	6	1988.1	5/2(+)			
		5361#	8	1398.8	7/2−			

$^{59}_{29}Cu_{30}$-37

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
6760	(3/2$^-$)	6759[#]	100	0.0	3/2$^-$	D+Q	−0.19 *+3−4*		
6797.3	(19/2$^+$)	1370.1 *3*	100	5427.0	(17/2$^+$)	D[i]			
6811	3/2$^{(-)}$	3883[#]	100 *20*	2928	5/2$^{(-)}$	D+Q	+0.55 *+9−20*		
		4823[#]	32 *6*	1988.1	5/2$^{(+)}$	D+Q			δ: +0.66 *+44−27*; unacceptably large for anticipated E1+M2 transition.
		6319[#]	56 *11*	491.5	1/2$^-$	D+Q	−0.30 *+12−25*		
		6810[#]	12.0 *20*	0.0	3/2$^-$	D(+Q)	−0.02 *+25−14*		
6836	(9/2$^+$)	1921[#]	2.8 *15*	4914.6	5/2$^{(+)}$,7/2,9/2$^{(-)}$				
		3793[#]	100.0 *15*	3042.5	9/2$^+$	(M1)		1.01×10^{-3}	B(M1)(W.u.)=0.075 *12* α(K)=1.89×10^{-5} *3*; α(L)=1.85×10^{-6} *3*; α(M)=2.60×10^{-7} *4* α(N)=8.02×10^{-9} *12*; α(IPF)=0.000991 *14* B(M1)(W.u.) calculated assuming Γ$_\gamma$=0.13 eV *2* from (p,p),(p,p′γ). δ(D,Q)=−0.02 *7*.
		4121[#]	2.0 *15*	2715.3	7/2$^-$				
		4249[#]	18.6 *15*	2587.3	11/2$^-$	D			δ(D,Q)=0.0 *1*.
		5437[#]	30.7 *15*	1398.8	7/2$^-$	(E1)		0.00215	B(E1)(W.u.)=1.6×10^{-4} *3* α(K)=8.71×10^{-6} *13*; α(L)=8.48×10^{-7} *12*; α(M)=1.192×10^{-7} *17* α(N)=3.68×10^{-9} *6*; α(IPF)=0.00214 *3* B(E1)(W.u.) calculated assuming Γ$_\gamma$=0.13 eV *2* from (p,p),(p,p′γ). δ(D,Q)=0.00 *5*.
6843	3/2	4519[#]	7.8 *18*	2324.1	3/2$^-$				
		4576[#]	5.7 *18*	2266.5	3/2$^+$				
		5928[#]	8.9 *18*	914.2	5/2$^-$				
		6351[#]	55.2 *18*	491.5	1/2$^-$	D+Q			δ: +0.3 *1* or −4 *1*.
		6842[#]	100.0 *18*	0.0	3/2$^-$	D+Q			δ: −0.4 *1* or −7 *2*.
6867	(3/2$^-$)	4600[#]	7.9 *16*	2266.5	3/2$^+$				
		5952[#]	10.0 *20*	914.2	5/2$^-$				
		6375[#]	100 *20*	491.5	1/2$^-$				
		6866[#]	13.2 *26*	0.0	3/2$^-$				
6879	(5/2$^+$)	3301[#]	14 *3*	3578					
		3764[#]	13 *3*	3114.4	5/2$^-$				
		3887[#]	44 *3*	2992.0	3/2,5/2$^-$,7/2$^-$				
		4173[#]	19 *3*	2706.3	5/2$^-$				

$^{59}_{29}Cu_{30}$-38

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
6879	(5/2$^+$)	4555[#]	24 *3*	2324.1	3/2$^-$				
		5480[#]	43 *3*	1398.8	7/2$^-$				
		5964[#]	100 *3*	914.2	5/2$^-$				
		6878[#]	62 *3*	0.0	3/2$^-$				
6885	(3/2$^-$,5/2)	2584[#]	21 *5*	4301	5/2$^{(-)}$				
		4179[#]	26 *5*	2706.3	5/2$^-$				
		4566[#]	32 *5*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$				
		4618[#]	47 *11*	2266.5	3/2$^+$				
		4897[#]	53 *11*	1988.1	5/2$^{(+)}$				
		5020[#]	42 *11*	1864.8	7/2$^-$				
		5486[#]	95 *11*	1398.8	7/2$^-$				
		5970[#]	100 *11*	914.2	5/2$^-$				
		6884[#]	63 *11*	0.0	3/2$^-$				
6894	5/2$^{(-)}$	3343[#]	28 *5*	3550.9	5/2$^-$	D+Q	−0.5 *3*		
		3779[#]	18 *5*	3114.4	5/2$^-$				
		4179[#]	30 *5*	2715.3	7/2$^-$				
		4188[#]	25 *5*	2706.3	5/2$^-$				
		4570[#]	53 *5*	2324.1	3/2$^-$	D			δ: −0.04 *12* from (p,γ).
		4627[#]	65 *5*	2266.5	3/2$^+$	D+Q	+0.5 *2*		
		4906[#]	71 *5*	1988.1	5/2$^{(+)}$	D(+Q)	−0.2 *2*		
		5495[#]	100 *5*	1398.8	7/2$^-$	D+Q	−1.4 *11*		
		5979[#]	56 *5*	914.2	5/2$^-$	D+Q			δ: −0.6 *3* or >+3 from (p,γ).
		6893.6[#]	55 *5*	0.0	3/2$^-$				
6905	9/2$^+$	1685[#p]	3.0 *4*	5220.3	9/2	D+Q	−0.12 *4*		
		1990[#]	2.4 *13*	4914.6	5/2$^{(+)}$,7/2,9/2$^{(-)}$				
		2375[#]	1.4 *13*	4530	(7/2)$^+$				
		2440[#]	1.2 *13*	4465	5/2$^{(+)}$,7/2,9/2$^{(-)}$				
		2464[#]	2.6 *13*	4441	7/2$^+$	(M1)		5.01×10^{-4}	B(M1)(W.u.)=0.07 *4* α(K)=3.78×10^{-5} *6*; α(L)=3.70×10^{-6} *6*; α(M)=5.20×10^{-7} *8* α(N)=1.604×10^{-8} *23*; α(IPF)=0.000459 *7* B(M1)(W.u.): assuming Γ$_\gamma$=1.1 eV *2* from (p,p),(p,p′γ). δ(D,Q)=−0.04 *8* from (p,γ).
		3147[#]	2.0 *13*	3758	5/2$^{(+)}$,7/2,9/2$^{(-)}$				
		3862[#]	100.0 *13*	3042.5	9/2$^+$	(M1+E2)	−0.031 *23*	1.04×10^{-3}	B(M1)(W.u.)=0.69 *13*; B(E2)(W.u.)=0.08 *+13−7*

$^{59}_{29}Cu_{30}$-39

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
									α(K)=1.84×10^{-5} *3*; α(L)=1.80×10^{-6} *3*; α(M)=2.52×10^{-7} *4* α(N)=7.80×10^{-9} *11*; α(IPF)=0.001017 *15* B(M1)(W.u.), B(E2)(W.u.): assuming Γ_γ=1.1 eV *2* from (p,p),(p,p′γ).
6905	9/2$^+$	4190[#]	3.5 *13*	2715.3	7/2$^-$	D			δ(D,Q)=−0.004 *22* from (p,γ).
		4318[#]	8.8 *13*	2587.3	11/2$^-$	D			δ(D,Q)=−0.02 *2* from (p,γ).
		5040[#]	1.4 *13*	1864.8	7/2$^-$				
		5506[#]	4.6 *13*	1398.8	7/2$^-$	(E1+M2)	+0.023 *16*	0.00217	B(E1)(W.u.)=2.2×10^{-4} *8*; B(M2)(W.u.)=0.018 *+26−17* α(K)=8.58×10^{-6} *12*; α(L)=8.35×10^{-7} *12*; α(M)=1.174×10^{-7} *17* α(N)=3.63×10^{-9} *5*; α(IPF)=0.00216 *3* B(E1)(W.u.), B(M2)(W.u.): assuming Γ_γ=1.1 eV *2* from (p,p),(p,p′γ).
		5990[#]	3.4 *13*	914.2	5/2$^-$				
6922	(17/2$^-$)	3475 *3*	100	3447.1	13/2$^-$	(Q)[i]			
6923	(5/2$^+$)	3345[#]	34.3 *22*	3578					
		4935[#]	100.0 *22*	1988.1	5/2$^{(+)}$				
		6008[#]	83.0 *22*	914.2	5/2$^-$				
6939	3/2$^{(-)}$	3210[#]	73 *5*	3729	3/2,5/2	Q(+D)			δ: −0.30 *5* or <−10.
		3947[#]	21 *5*	2992.0	3/2,5/2$^-$,7/2$^-$				
		4224[#]	36 *5*	2715.3	7/2$^-$				
		4615[#]	44 *5*	2324.1	3/2$^-$				
		4620[#]	17 *5*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$				
		4672[#]	100 *5*	2266.5	3/2$^+$	Q(+D)			δ: −0.2 *1* or >+7.
		5074[#]	26 *5*	1864.8	7/2$^-$				
		6024[#]	39 *5*	914.2	5/2$^-$	Q(+D)	>+0.3		
		6447[#]	60 *5*	491.5	1/2$^-$	D+Q			δ: +0.25 *11* or −4 *2*.
		6938[#]	35 *5*	0.0	3/2$^-$				
6945	1/2$^-$,3/2$^-$	4621[#]	15.6 *22*	2324.1	3/2$^-$				
		4626[#]	28.5 *22*	2318.5	1/2$^{(-)}$,5/2$^{(-)}$				
		4678[#]	52.0 *22*	2266.5	3/2$^+$				
		6453[#]	23.2 *22*	491.5	1/2$^-$				
		6944[#]	100.0 *22*	0.0	3/2$^-$				
6959	(3/2)	4692[#]		2266.5	3/2$^+$				
		6958[#]		0.0	3/2$^-$	D+Q	+0.10 *9*		
6967	(3/2,5/2)	3389[#]	6.8 *17*	3578					

$^{59}_{29}Cu_{30}$-40

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
6967	(3/2,5/2)	3837[#]	3.5 *17*	3129.9	3/2$^-$			
		4700[#]	10.2 *17*	2266.5	3/2$^+$			
		4979[#]	10.9 *17*	1988.1	5/2$^{(+)}$			
		6052[#]	42.2 *17*	914.2	5/2$^-$			
		6966[#]	100.0 *17*	0.0	3/2$^-$			
7016		7015[#]		0.0	3/2$^-$			
7029	(3/2$^-$)	7028[#]		0.0	3/2$^-$			
7048		7047[#]		0.0	3/2$^-$			
7053.2	(19/2$^-$)	1003.1[d] *2*	100[i] *7*	6049.8	(17/2$^-$)	D+Q[i]		
		1331.2 *3*	23[i] *4*	5722.2	(17/2$^-$)	D+Q[i]		δ: +0.5>δ>−1.7.
		2149.6 *4*	20[i] *4*	4904.0	(15/2$^-$)	Q[i]		
7074.4	(17/2$^+$)	2547 *1*	100	4527.9	(13/2$^+$)	Q[i]		
7137.3	(5/2$^+$)	7136.6 *10*		0.0	3/2$^-$			
7197	(3/2)	6282[#]	32	914.2	5/2$^-$	D+Q	+0.11 *+11−10*	
		6705[#]	100	491.5	1/2$^-$	D+Q	+0.04 *3*	
7251	(5/2,3/2$^-$)	4545[#]	23	2706.3	5/2$^-$			
		4586[#]		2664.6	(9/2$^-$)			
		4984[#]	19	2266.5	3/2$^+$			
		5852[#]	31	1398.8	7/2$^-$			
		6336[#]	25	914.2	5/2$^-$			
		7250.5[#]	100	0.0	3/2$^-$	D		
7299	(3/2)$^+$	4169[#]	11.1 *14*	3129.9	3/2$^-$			
		4371[#p]		2928	5/2$^{(-)}$	D+Q	+0.17 *13*	
		4593[#p]		2706.3	5/2$^-$	D		
		5032[#]	8.3 *14*	2266.5	3/2$^+$			
		5311[#]	8.3 *14*	1988.1	5/2$^{(+)}$	D		Other Iγ: 23 from 1994Ho31 in (p,γ).
		5900[#p]		1398.8	7/2$^-$			
		6384[#]	11.1 *14*	914.2	5/2$^-$	D		Other Iγ: 6.3 from 1994Ho31 in (p,γ).
		7298.5[#]	100.0 *14*	0.0	3/2$^-$	D+Q	−0.23 *+3−2*	
7332	3/2	7331[#]	100	0.0	3/2$^-$			
7348	(3/2$^-$)	3770[#]	29.4 *15*	3578				
		6433[#]	17.6 *15*	914.2	5/2$^-$			
		7347[#]	100.0 *15*	0.0	3/2$^-$	D+Q		Mult.,δ: from (p,γ); δ=−0.5 *1* or −6 *3*.
7352.8	(19/2$^+$)	555.3 *2*	7 *2*	6797.3	(19/2$^+$)	[m]		
		662.2 *2*	70[i] *8*	6690.4	(17/2$^+$)	D+Q[i]		E_γ: Doublet structure (^{28}Si,2αpγ).
		1177.9 *3*	10[i] *3*	6174.9	(15/2$^+$)	Q[i]		

$^{59}_{29}Cu_{30}$-41

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
7352.8	(19/2$^+$)	1630.7 *3*	100[i] *10*	5722.2	(17/2$^-$)	D[i]		
		1925.8 *7*	20[i] *3*	5427.0	(17/2$^+$)	D[i]		
7394	(5/2)$^+$	3816[#]	100.0 *14*	3578		D+Q	+0.13 *5*	
		5406[#]	18.1 *14*	1988.1	5/2$^{(+)}$			
		5529[#]	11.1 *14*	1864.8	7/2$^-$			
		7393[#]	9.7 *14*	0.0	3/2$^-$			
7407	(1/2$^+$)	7406[#]	100	0.0	3/2$^-$			
7444	(3/2$^+$,5/2$^+$)	3829[#]	21.4 *14*	3615.3	3/2$^-$			
		3866[#]	21.4 *14*	3578				
		7443[#]	100.0 *14*	0.0	3/2$^-$			
7444.6	(21/2$^-$)	833.7 *2*	75[i] *5*	6610.6	(19/2$^-$)	D+Q[i]	+0.20 *+5−6*	
		1723.3 *3*	100[i] *5*	5722.2	(17/2$^-$)	Q[i]		
7473		7472[#]		0.0	3/2$^-$			
7503		7502[#]		0.0	3/2$^-$			E_γ: 7498 *3* for probable doublet in (p,γ).
7517	(5/2$^-$)	6118[#]	100.0 *14*	1398.8	7/2$^-$			
		7516[#]	42.9 *14*	0.0	3/2$^-$			
7523		7522[#]		0.0	3/2$^-$			E_γ: probable doublet in (p,γ).
7539	(3/2$^-$)	6624[#]	36.4 *18*	914.2	5/2$^-$			
		7047[#]	100.0 *18*	491.5	1/2$^-$			
		7538[#]	45.4 *18*	0.0	3/2$^-$			
7543.1		2116 *2*	100	5427.0	(17/2$^+$)			
7616.5	(21/2$^-$)	1894 *1*	100	5722.2	(17/2$^-$)			E_γ: Doublet structure.
7650	5/2$^+$	6251[#]	66.7 *17*	1398.8	7/2$^-$	D		
		7649[#]	100.0 *17*	0.0	3/2$^-$	D		
7697	(5/2)	5709[#]	26.3 *26*	1988.1	5/2$^{(+)}$			
		5832[#]	44.7 *26*	1864.8	7/2$^-$			
		6298[#]	47.4 *26*	1398.8	7/2$^-$			
		7696[#]	100.0 *26*	0.0	3/2$^-$			
7708.6	(19/2$^+$)	2281.1[e] *5*	100	5427.0	(17/2$^+$)	D+Q[i]		
7794.7	(17/2$^+$)	1045[@p]	11[i] *5*	6750.0	(17/2$^+$)	m		
		2073	37[i] *16*	5722.2	(17/2$^-$)	m		
		2890 *1*	100[i] *26*	4904.0	(15/2$^-$)	D[i]		
		3266 *2*	11[i] *5*	4527.9	(13/2$^+$)			
7827.7	(17/2$^+$)	1077.8[@p] *1*	<5.56[i]	6750.0	(17/2$^+$)	m		
		2105.3[@p] *1*	28[i] *11*	5722.2	(17/2$^-$)	m		
		2400.7[@p] *1*	22[i] *6*	5427.0	(17/2$^+$)	m		
		2923 *1*	100[i] *11*	4904.0	(15/2$^-$)	D		

$^{59}_{29}Cu_{30}$-42

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
7827.7	(17/2$^+$)	3298 *2*	17[i] *7*	4527.9	(13/2$^+$)			
8013		7521[#]	49.3 *15*	491.5	1/2$^-$			
		8012[#]	100.0 *15*	0.0	3/2$^-$			
8077	3/2$^{(-)}$,5/2	8076[#]	100	0.0	3/2$^-$	D+Q		δ: −0.09 *2* if J(8077 level)=5/2; −1.0 *2* or −1.7 *3* if J=3/2.
8113.3	(21/2$^-$)	1060 *1*	29 *7*	7053.2	(19/2$^-$)	D+Q		
		2063.4[@]	100 *7*	6049.8	(17/2$^-$)	Q		
8116.0	(21/2$^+$)	762.9 *2*	100[i] *8*	7352.8	(19/2$^+$)	D+Q[i]	+0.10 *+6−7*	
		1426.0 *3*	67[i] *7*	6690.4	(17/2$^+$)	Q[i]		
		1505.5 *3*	41.7[i] *17*	6610.6	(19/2$^-$)	D[i]		
		2688[@] *1*	13.3[i] *25*	5427.0	(17/2$^+$)			
8155.6	(19/2$^+$)	327.9 *1*	100[i] *3*	7827.7	(17/2$^+$)	D+Q[i]	+0.13 *+7−9*	
		360.9 *1*	76[i] *3*	7794.7	(17/2$^+$)	D+Q[i]	+0.15 *7*	
		1102.7[@p] *4*	8 *3*	7053.2	(19/2$^-$)	*mi*		
		2432.8 *6*	81[i] *6*	5722.2	(17/2$^-$)	D[i]		
		2728 *1*	21[i] *3*	5427.0	(17/2$^+$)	D+Q[i]	+0.45 *+13−10*	
8223	3/2$^{(-)}$,5/2	8222[#]	100	0.0	3/2$^-$	D+Q		δ: −0.07 *3* if J(8223 level)=5/2; −0.9 *2* or −1.8 *3* if J=3/2 (p,γ).
8259	(5/2)$^+$	8258[#]	100	0.0	3/2$^-$	D(+Q)	−0.02 *3*	
8513	(21/2$^-$)	1591[e] *1*	100	6922	(17/2$^-$)	(Q)[i]		
8657.7	(21/2$^+$)	3230 *2*	100	5427.0	(17/2$^+$)	Q[i]		
8729.8	(21/2$^+$)	574.1 *1*	100[i] *3*	8155.6	(19/2$^+$)	D+Q[i]	+0.16 *+5−12*	
		2118.7 *7*	12[i] *3*	6610.6	(19/2$^-$)	D[i]		
		3302 *1*	12[i] *1*	5427.0	(17/2$^+$)	Q[i]		
8813.8	(23/2$^-$)	1368.7 *3*	100[i] *6*	7444.6	(21/2$^-$)	D+Q[i]	+0.14 *6*	
		2204.0 *4*	50[i] *4*	6610.6	(19/2$^-$)	Q[i]		
8852.6	(21/2$^-$)	2055.5 *4*	100	6797.3	(19/2$^+$)	D[i]		
8943.5	(23/2$^+$)	827.4 *2*	100[i] *10*	8116.0	(21/2$^+$)	D+Q[i]	+0.18 *+5−6*	
		1499.1 *10*	80[i] *20*	7444.6	(21/2$^-$)	D[i]		
		1591.1 *3*	100[i] *10*	7352.8	(19/2$^+$)	Q[i]		
		2147 *1*	6[i] *2*	6797.3	(19/2$^+$)	Q[i]		
9174.5	(23/2$^-$)	1061[e] *1*	30[i] *10*	8113.3	(21/2$^-$)	D+Q[i]		
		1730[de] *1*	28[i] *6*	7444.6	(21/2$^-$)	D+Q[i]		
		2121.4 *8*	100[i] *18*	7053.2	(19/2$^-$)	Q[i]		
9175.3	(21/2$^+$)	3748 *2*	100	5427.0	(17/2$^+$)	Q[i]		
9293.8	(21/2$^+$)	3867 *2*	100	5427.0	(17/2$^+$)	Q[i]		
9333.3	(23/2$^-$)	1888.5[e] *4*	100[i] *10*	7444.6	(21/2$^-$)			
		2724 *1*	18[i] *4*	6610.6	(19/2$^-$)			
9433.2	(21/2$^+$)	1725[e] *1*	27[i] *7*	7708.6	(19/2$^+$)	D+Q[i]		
		2636 *1*	100[i] *20*	6797.3	(19/2$^+$)	D+Q[i]		

$^{59}_{29}Cu_{30}$-43

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
9457.4	(23/2$^+$)	727.5[e] *1*	100[i] *8*	8729.8	(21/2$^+$)	D+Q[i]		
		1302.1[e] *3*	31[i] *4*	8155.6	(19/2$^+$)	Q[i]		

$^{59}_{29}Cu_{30}$-44

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ †	I_γ h	E_f	J_f^π	Mult. k	δ ko	Comments
9626.1	(21/2$^+$)	4200 *3*	100	5427.0	(17/2$^+$)			
9673.0	(25/2$^+$)	729.4 e *1*	100 i *9*	8943.5	(23/2$^+$)	D+Q i		
		1557.1 *3*	82 i *9*	8116.0	(21/2$^+$)	Q i		
9923.4	(21/2$^+$)	4498 *3*	100	5427.0	(17/2$^+$)			
10120.3	(21/2$^+$)	2410 *2*	100 i *50*	7708.6	(19/2$^+$)			
		3323 *2*	100 i *50*	6797.3	(19/2$^+$)			
		3512 *2*	100 i *50*	6610.6	(19/2$^-$)			
10143.0	(21/2$^+$)	517 *1*	<12.5 i	9626.1	(21/2$^+$)			
		2433 *1*	38 i *13*	7708.6	(19/2$^+$)	D+Q i		
		2791 *2*	<12.5 i	7352.8	(19/2$^+$)			
		3069 *1*	38 i *13*	7074.4	(17/2$^+$)			
		4716 *2*	100 i *25*	5427.0	(17/2$^+$)	Q i		
10225.2	(21/2$^+$)	3615 *3*	100	6610.6	(19/2$^-$)			
10277.8	(25/2$^+$)	819.8 e *2*	100 i *6*	9457.4	(23/2$^+$)	D+Q i		δ: +0.21 *5* or +6.3 *+78−14*.
		1548.8 *4*	76 i *11*	8729.8	(21/2$^+$)	Q i		
10363.3	(21/2$^+$)	3611 *3*	<12.5 i	6750.0	(17/2$^+$)			
		3753 e *2*	100 i *62*	6610.6	(19/2$^-$)			
		4937 *4*	38 i *13*	5427.0	(17/2$^+$)	Q i		
10372.3	(25/2$^-$)	1197.8 *6*	17.5 i *25*	9174.5	(23/2$^-$)	D+Q i		
		2259 *1*	100 i *22*	8113.3	(21/2$^-$)	Q i		
		2928 *1*	20 i *7*	7444.6	(21/2$^-$)	Q i		
10381.4	(21/2$^+$)	3586 *3*	60 i *20*	6797.3	(19/2$^+$)			
		3770 *2*	100 i *40*	6610.6	(19/2$^-$)			
10605.2	(27/2$^+$)	932.1 *2*	100 i *7*	9673.0	(25/2$^+$)	D+Q i	+0.24 *5*	
		1662.0 *3*	57 i *4*	8943.5	(23/2$^+$)	Q i		
10657.4	(21/2$^-$)	4047 *4*	100	6610.6	(19/2$^-$)			
10679.0	(21/2$^-$)	3234 *2*	100 i *33*	7444.6	(21/2$^-$)	*mi*		
		4072 *4*	<33 i	6610.6	(19/2$^-$)			
		4629 *3*	67 i *33*	6049.8	(17/2$^-$)			
		4957 *4*	67 i *33*	5722.2	(17/2$^-$)	Q i		
10824.0	(25/2$^-$)	2010.4 *4*	100	8813.8	(23/2$^-$)	(D+Q) i		
10867	(23/2$^-$)	3422 *3*	100	7444.6	(21/2$^-$)	D+Q i		
11122.4	(23/2$^-$)	3007 *2*	100 i *15*	8116.0	(21/2$^+$)	D i		
		3505 *2*	25 i *5*	7616.5	(21/2$^-$)	D+Q i		
		3678 *2*	75 i *10*	7444.6	(21/2$^-$)	D+Q i		δ: −0.2>δ>−2.0.
11213.4	(27/2$^+$)	935.0 e *2*	76 i *6*	10277.8	(25/2$^+$)			
		1756.3 *3*	100 i *6*	9457.4	(23/2$^+$)	Q i		
11216.6	(23/2$^+$)	3101 e *2*	<100	8116.0	(21/2$^+$)			
		4420 *3*	<100	6797.3	(19/2$^+$)			

$^{59}_{29}Cu_{30}$-45

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ [h]	E_f	J_f^π	Mult.[k]	δ[ko]	Comments
11250	(23/2)	3805 *3*	100 *2*	7444.6	(21/2$^-$)	D[l]		
11371.4	(25/2$^-$)	3926 *3*	100 *5*	7444.6	(21/2$^-$)	Q		

$^{59}_{29}Cu_{30}$-46

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	Comments
11660.8	(27/2$^-$)	1288.7[@] *1*	36 *27*	10372.3	(25/2$^-$)		
		2328 *1*	73 *27*	9333.3	(23/2$^-$)	Q[i]	
		2486 *1*	100 *45*	9174.5	(23/2$^-$)	Q[i]	
11721.3	(25/2$^-$)	598.8 *1*	100 *8*	11122.4	(23/2$^-$)	D[i]	
		1042.4 *9*	35 *5*	10679.0	(21/2$^-$)	Q[i]	
		1064 *2*	5.0 *25*	10657.4	(21/2$^-$)		
		2870 *1*	20 *5*	8852.6	(21/2$^-$)	Q[i]	
		3608.1[@]	7.5 *25*	8113.3	(21/2$^-$)		
		4277 *3*	50 *5*	7444.6	(21/2$^-$)	Q[i]	
11839.2	(25/2$^+$)	1614 *1*	100 *25*	10225.2	(21/2$^+$)	Q[i]	
		1696 *2*	63 *13*	10143.0	(21/2$^+$)		
		1718[e] *1*	63 *13*	10120.3	(21/2$^+$)		
		1916 *1*	75 *13*	9923.4	(21/2$^+$)		
		2506 *1*	50 *13*	9333.3	(23/2$^-$)	D[i]	
		2665[@] *2*	<12.5	9175.3	(21/2$^+$)		E_γ: doublet.
		2896 *2*	100 *25*	8943.5	(23/2$^+$)	D+Q[i]	
11919.4	(25/2$^+$)	703 *1*	6 *3*	11216.6	(23/2$^+$)		
		1538 *1*	35 *6*	10381.4	(21/2$^+$)		
		1556[e] *1*	100 *10*	10363.3	(21/2$^+$)	Q[i]	
		1776 *1*	74 *3*	10143.0	(21/2$^+$)	Q[i]	
		1800 *1*	16 *3*	10120.3	(21/2$^+$)		
		1996 *2*	10 *3*	9923.4	(21/2$^+$)		
		2462 *1*	77 *13*	9457.4	(23/2$^+$)	D+Q[i]	
		2583 *2*	45 *13*	9333.3	(23/2$^-$)	D[i]	
		2626 *2*	6 *3*	9293.8	(21/2$^+$)		
		2744 *2*	13 *3*	9175.3	(21/2$^+$)		
		3104 *2*	26 *6*	8813.8	(23/2$^-$)	D[i]	
		3192 *2*	6 *3*	8729.8	(21/2$^+$)		
		3261 *2*	32 *10*	8657.7	(21/2$^+$)	Q[i]	
		3802 *2*	26 *10*	8116.0	(21/2$^+$)		
11938.3	(25/2$^-$)	2998 *2*		8943.5	(23/2$^+$)		
		3425[p] *3*	<100	8513	(21/2$^-$)		
11983.3	(23/2$^-$)	4931 *2*	100	7053.2	(19/2$^-$)		
12040.8	(25/2$^+$)	1763 *1*	29 *14*	10277.8	(25/2$^+$)	*m*	
		2584 *1*	71 *21*	9457.4	(23/2$^+$)	D+Q[i]	
		2608 *1*	36 *21*	9433.2	(21/2$^+$)		
		3097 *2*	14 *7*	8943.5	(23/2$^+$)		
		3311 *2*	14 *7*	8729.8	(21/2$^+$)		
		3383[@] *2*	<7.14	8657.7	(21/2$^+$)		
		3922 *2*	100 *21*	8116.0	(21/2$^+$)	Q[i]	
12112.6	(27/2$^-$)	3299 *2*	100	8813.8	(23/2$^-$)	Q[i]	

$^{59}_{29}Cu_{30}$-47

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	Comments
12245.4	$(25/2^+)$	1864 *1*	75 *25*	10381.4	$(21/2^+)$	Q[i]	

$^{59}_{29}Cu_{30}$-48

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]	α[n]	Comments
12245.4	(25/2$^+$)	3431 *2*	100 *25*	8813.8	(23/2$^-$)	D[i]			
12248.9	(29/2$^+$)	1035.0 *3*	46 *7*	11213.4	(27/2$^+$)	D+Q[i]	+0.21 *+10−11*		
		1971.7 *4*	100 *12*	10277.8	(25/2$^+$)	Q[i]			
12375.4	(27/2$^-$)	654.0 *1*	100 *13*	11721.3	(25/2$^-$)	D+Q[i]			
		1253.6 *3*	73 *13*	11122.4	(23/2$^-$)	Q[i]			
		1552 *1*	10.0 *25*	10824.0	(25/2$^-$)				
		3042 *2*	30 *8*	9333.3	(23/2$^-$)	Q[i]			
		3202 *3*	28 *15*	9174.5	(23/2$^-$)	Q[i]			
		3561 *2*	50 *13*	8813.8	(23/2$^-$)	Q[i]			
12420.7	(29/2$^+$)	1815.6 *4*	100 *13*	10605.2	(27/2$^+$)	D+Q[i]	+0.23 *+7−8*		
		2748 *1*	63 *3*	9673.0	(25/2$^+$)				
12554.1	(27/2$^-$)	615.8 *1*	40 *20*	11938.3	(25/2$^-$)				
		2277 *2*	100 *33*	10277.8	(25/2$^+$)	D			
		2883[e] *2*	80 *30*	9673.0	(25/2$^+$)	D			
		3743 *3*	<10	8813.8	(23/2$^-$)				
12810.0	(29/2)	2204.5 *4*	100	10605.2	(27/2$^+$)	D+Q[l]	−0.10 *8*		
13105.5	(29/2$^-$)	730.0 *1*	100 *10*	12375.4	(27/2$^-$)	D+Q[i]			
		1385.1 *9*	100.0 *25*	11721.3	(25/2$^-$)	Q[i]			
		2501 *1*	33 *5*	10605.2	(27/2$^+$)	D[i]			
13128.1	(27/2$^-$)	1145 *1*	86 *14*	11983.3	(23/2$^-$)	Q[i]			
		4313 *2*	100 *14*	8813.8	(23/2$^-$)	Q[i]			
13195.6	(29/2$^-$)	641.4 *1*	50 *10*	12554.1	(27/2$^-$)	D+Q[i]			
		1083 *1*	10 *3*	12112.6	(27/2$^-$)	D+Q[i]			
		1257.9 *3*	20 *10*	11938.3	(25/2$^-$)	Q[i]			
		1476[e] *1*	13 *3*	11721.3	(25/2$^-$)				
		1824 *1*	<3.3	11371.4	(25/2$^-$)				
		1981.1 *4*	37 *10*	11213.4	(27/2$^+$)				
		2372 *1*	13 *3*	10824.0	(25/2$^-$)				
		2591 *1*	100 *13*	10605.2	(27/2$^+$)	D[i]			
		2824 *2*	27 *10*	10372.3	(25/2$^-$)	Q[i]			
13353.5	(29/2$^+$)	1108 *1*	6.5 *6*	12245.4	(25/2$^+$)	Q[i]			
		1313 *1*	28.8 *18*	12040.8	(25/2$^+$)	Q[i]			
		1434 *1*	100 *6*	11919.4	(25/2$^+$)	Q[i]			
		1514 *1*	24.1 *18*	11839.2	(25/2$^+$)	Q[i]			
13360.5	(31/2$^+$)	1111.0 *6*	26 *5*	12248.9	(29/2$^+$)	(M1+E2)	+0.44 *+10−12*	1.86×10^{-4} *4*	α(K)=0.000167 *3*; α(L)=1.64×10^{-5} *3*; α(M)=2.31×10^{-6} *4* α(N)=7.09×10^{-8} *13*; α(IPF)=8.6×10^{-7} *4*
		2147.1 *5*	100 *7*	11213.4	(27/2$^+$)	Q[i]			
13422.6	(29/2$^-$)	3050 *3*	100	10372.3	(25/2$^-$)	Q[i]			
13480.8	(27/2$^+$)	3110[e] *3*	100	10372.3	(25/2$^-$)	D[i]			

$^{59}_{29}Cu_{30}$-49

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [h]	E_f	J_f^π	Mult. [k]	δ [ko]	α [n]	Comments
13520.4	(29/2$^-$)	1858.9 *20*	44 *23*	11660.8	(27/2$^-$)				
		3148 *3*	100 *23*	10372.3	(25/2$^-$)	(Q) [i]			
13528.6	(31/2)	718.6 *1*	100 *13*	12810.0	(29/2)	D+Q [i]			

$^{59}_{29}Cu_{30}$-50

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]
13528.6	(31/2)	1108.0 *2*	45 *8*	12420.7	(29/2$^+$)	D+Q[li]	+0.16 *+11−8*
13920.3	(31/2$^-$)	814.6 *2*	80 *4*	13105.5	(29/2$^-$)	D+Q[i]	
		1545.6 *3*	100 *20*	12375.4	(27/2$^-$)	Q[i]	
13934.4	(31/2$^-$)	739[e] *1*	6.7 *22*	13195.6	(29/2$^-$)	D+Q[i]	
		1379 *1*	22 *4*	12554.1	(27/2$^-$)	Q[i]	
		1560[e] *1*	100 *11*	12375.4	(27/2$^-$)	Q[i]	
14237.9	(29/2$^-$)	1378[e] *1*	100 *33*	12859.4	(25/2$^-$)		
		2579[d] *2*	67 *17*	11660.8	(27/2$^-$)	D+Q[i]	
14519.4	(33/2)	990.8 *2*	100	13528.6	(31/2)	D+Q[i]	+0.16 *6*
14586.9	(33/2$^+$)	1225[d] *1*	41 *9*	13360.5	(31/2$^+$)		
		2338.3 *5*	100 *14*	12248.9	(29/2$^+$)	Q[i]	
14654.1	(31/2$^-$)	1526 *1*	100	13128.1	(27/2$^-$)	Q[i]	
14700.4		4095 *3*	100 *20*	10605.2	(27/2$^+$)		
		4328 *3*	40 *20*	10372.3	(25/2$^-$)		
14784.3	(33/2$^-$)	850 *1*	13 *3*	13934.4	(31/2$^-$)	D+Q[i]	≈+1
		1588.7 *3*	100 *7*	13195.6	(29/2$^-$)	Q[i]	
14952.8	(33/2$^+$)	1599.3 *5*	100	13353.5	(29/2$^+$)	Q[i]	
14957.3	(33/2$^-$)	1038[e] *1*	71 *14*	13920.3	(31/2$^-$)	D+Q[i]	−0.15 *+5−7*
		1850.9 *8*	100 *14*	13105.5	(29/2$^-$)	Q[i]	
15331.6	(31/2$^+$)	1811[e] *1*	100 *33*	13520.4	(29/2$^-$)	D[i]	
		1851[e] *1*	<11	13480.8	(27/2$^+$)		
		1909[e] *1*	56 *22*	13422.6	(29/2$^-$)		
15726.1	(35/2$^-$)	942 *1*	24 *4*	14784.3	(33/2$^-$)	D+Q[i]	≈+2
		1791.6 *4*	100 *12*	13934.4	(31/2$^-$)	Q[i]	
		1806 *1*	40 *8*	13920.3	(31/2$^-$)	Q[i]	
15958.9	(33/2$^-$)	1304.8[e] *5*	33 *8*	14654.1	(31/2$^-$)	D+Q[i]	
		1721[e] *1*	100 *17*	14237.9	(29/2$^-$)	Q[i]	
15986.0	(35/2$^-$)	1028 *1*	53 *21*	14957.3	(33/2$^-$)	D+Q[i]	−0.15 *+5−7*
		2066[e] *1*	100 *21*	13920.3	(31/2$^-$)	Q[i]	
16032.5	(35/2$^+$)	1445[@] *1*	24 *6*	14586.9	(33/2$^+$)		
		2672[e] *1*	100 *18*	13360.5	(31/2$^+$)	Q[i]	
16505.5		1805 *1*	100	14700.4			
16561.1	(35/2$^-$)	1907 *1*	100	14654.1	(31/2$^-$)	Q[i]	
16756.8	(37/2$^-$)	1031[e] *1*	9.1 *18*	15726.1	(35/2$^-$)	D+Q[i]	≈+1
		1972.4[e] *6*	100.0 *18*	14784.3	(33/2$^-$)	Q[i]	
16852.6	(37/2$^+$)	1899.8 *6*	100	14952.8	(33/2$^+$)	Q[i]	
17125.1	(37/2$^-$)	1139 *1*	33 *17*	15986.0	(35/2$^-$)	D+Q[i]	+0.69 *+6−8*
		2168 *1*	100 *17*	14957.3	(33/2$^-$)	Q[i]	
17607.7	(35/2$^+$)	2276[e] *1*	100	15331.6	(31/2$^+$)	Q[i]	

$^{59}_{29}Cu_{30}$-51

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]
17830.2	(37/2$^+$)	1798[d] *2*	33 *17*	16032.5	(35/2$^+$)		
		3243 *2*	100 *33*	14586.9	(33/2$^+$)		

$^{59}_{29}Cu_{30}$-52

Adopted Levels, Gammas (continued)

γ(^{59}Cu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]
17884		4523 *4*	100	13360.5	(31/2$^+$)		
17963.1	(39/2$^-$)	2237 *1*	100	15726.1	(35/2$^-$)	Q[i]	
18029.0	(37/2$^-$)	2070.1[e] *7*	100	15958.9	(33/2$^-$)	Q[i]	
18310.3	(39/2$^-$)	1184.7[e] *10*	50 *15*	17125.1	(37/2$^-$)	D+Q[i]	+0.12 *5*
		2324 *1*	100 *9*	15986.0	(35/2$^-$)	Q[i]	
18680		4160 *4*	100	14519.4	(33/2)		
18883	(39/2$^-$)	2322 *2*	100	16561.1	(35/2$^-$)	Q[i]	
18955		4435 *4*	100	14519.4	(33/2)		
19095.1	(41/2$^+$)	2242.4 *7*	100	16852.6	(37/2$^+$)	Q[i]	
19428.5	(41/2$^-$)	2674[@] *1*	100	16756.8	(37/2$^-$)	Q[i]	
19672.3	(41/2$^-$)	1361.9 *3*	28 *13*	18310.3	(39/2$^-$)	D+Q[i]	+0.02 *1*
		2548 *1*	100 *13*	17125.1	(37/2$^-$)	Q[i]	
19837	(39/2$^+$)	2006[@] *1*	<25	17830.2	(37/2$^+$)		
		3804 *3*	100 *25*	16032.5	(35/2$^+$)		
19918	(39/2$^+$)	3885 *3*	100	16032.5	(35/2$^+$)	(Q)	
19930.7	(39/2$^+$)	2323[e] *1*	100	17607.7	(35/2$^+$)	Q	
20524.1	(41/2$^-$)	2495 *1*	100	18029.0	(37/2$^-$)	Q	
20708		1753 *2*	<100	18955			
		2028 *1*	<100	18680			
21096.3	(43/2$^-$)	1424 *2*	15 *5*	19672.3	(41/2$^-$)	D+Q[i]	
		2786 *2*	100 *20*	18310.3	(39/2$^-$)	Q[i]	
21258	(43/2$^-$)	3295 *3*	100	17963.1	(39/2$^-$)		
21641	(43/2$^-$)	2758 *2*	100	18883	(39/2$^-$)	Q[i]	
21706.1	(45/2$^+$)	2611 *1*	100	19095.1	(41/2$^+$)	Q[i]	
22051	(41/2$^+$)	2214 *1*	100	19837	(39/2$^+$)		
22580	(43/2$^+$)	2649 *2*	100	19930.7	(39/2$^+$)		
22686.4	(45/2$^-$)	1590[e] *1*	75 *25*	21096.3	(43/2$^-$)	D+Q[i]	
		3014 *2*	100 *38*	19672.3	(41/2$^-$)	Q[i]	
23459	(45/2$^-$)	2935 *2*	100	20524.1	(41/2$^-$)	(Q)[i]	
23529	(45/2$^-$)	4100 *4*	100	19428.5	(41/2$^-$)		
24318.6	(47/2$^-$)	1632 *1*	67 *17*	22686.4	(45/2$^-$)		
		3223 *3*	100 *33*	21096.3	(43/2$^-$)		
24710	(49/2$^+$)	3004 *2*	100	21706.1	(45/2$^+$)	Q	
24769	(47/2$^-$)	3128 *2*	100	21641	(43/2$^-$)		
25679	(47/2$^+$)	3099 *3*	100	22580	(43/2$^+$)		
26226	(49/2$^-$)	3539 *3*	100	22686.4	(45/2$^-$)		
26840?	(49/2$^-$)	3382[p] *3*	<100	23459	(45/2$^-$)		
28134	(53/2$^+$)	3424 *1*	100	24710	(49/2$^+$)	Q[i]	
31961	(57/2$^+$)	3827 *1*	<100	28134	(53/2$^+$)		
1631.0+x	(J+2)	1631 *1*	100	x	(J)		
3647.0+x	(J+4)	2016 *1*	100	1631.0+x	(J+2)		
6005.1+x	(J+6)	2358 *1*	100	3647.0+x	(J+4)		

$^{59}_{29}Cu_{30}$-53

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[h]	E_f	J_f^π	Mult.[k]	δ[ko]
8812.2+x	(J+8)	2807 *2*	100	6005.1+x	(J+6)		

$^{59}_{29}Cu_{30}$-54

Adopted Levels, Gammas (continued)

$\gamma(^{59}Cu)$ (continued)

† Unless noted otherwise, Eγ values are from $^{40}Ca(^{28}Si,2\alpha p\gamma)$. Most of the E$\gamma$ values are in good agreement with values in other datasets, however, some are discrepant. Calculated γ-ray energies are added by the evaluator to list γ-ray properties when reported by authors without the energy. Note that some of these calculated γ-ray energies might be different compared calculated values in source dataset due to differences in level energies.

‡ Calculated by evaluator from level energy difference and recoil energy subtraction (placement in 1978Sc07 (^{3}He,dγ)). Eγ excluded from least-squares level energy adjustment.

Calculated by evaluator from level energy difference and recoil energy subtraction (placement in 1985Di05 (p,γ)). Eγ excluded from least-squares level energy adjustment.

@ From level energy difference ($^{28}Si,2\alpha p\gamma$), omitted in least-squares fit.

& Weighted average of data from (^{3}He,pnγ) and ($^{28}Si,2\alpha p\gamma$).

a Weighted average of data from (^{3}He,pnγ), ($^{28}Si,2\alpha p\gamma$) and (^{3}He,dγ).

b Unweighted average from (^{3}He,pnγ), ($^{28}Si,2\alpha p\gamma$) and (^{3}He,dγ).

c Weighted average from ε decay, (p,γ), (^{3}He,pnγ), (^{3}He,dγ), and ($^{28}Si,2\alpha p\gamma$).

d Doublet with intense transitions in ^{57}Co or ^{58}Ni ($^{28}Si,2\alpha p\gamma$).

e Doublet structure ($^{28}Si,2\alpha p\gamma$).

f From (^{3}He,pnγ).

g From (^{3}He,dγ).

h From (p,γ), except as noted.

i From ($^{28}Si,2\alpha p\gamma$).

j Weighted average of data from (p,γ) and ($^{28}Si,2\alpha p\gamma$).

k From $\gamma(\theta)$ in ^{58}Ni(p,γ), except as noted. For more than one δ values from a dataset, additional one listed in comments section with equal preferences, unless noted otherwise. Sign assigned based on RUL, if level lifetime available.

l ΔJ=1 transition; mult=D or D+Q ($^{28}Si,2\alpha p\gamma$).

m ΔJ=0 transition; mult=D or D+Q ($^{28}Si,2\alpha p\gamma$).

n Additional information 9.

o If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.

p Placement of transition in the level scheme is uncertain.

$^{59}_{29}Cu_{30}$-55

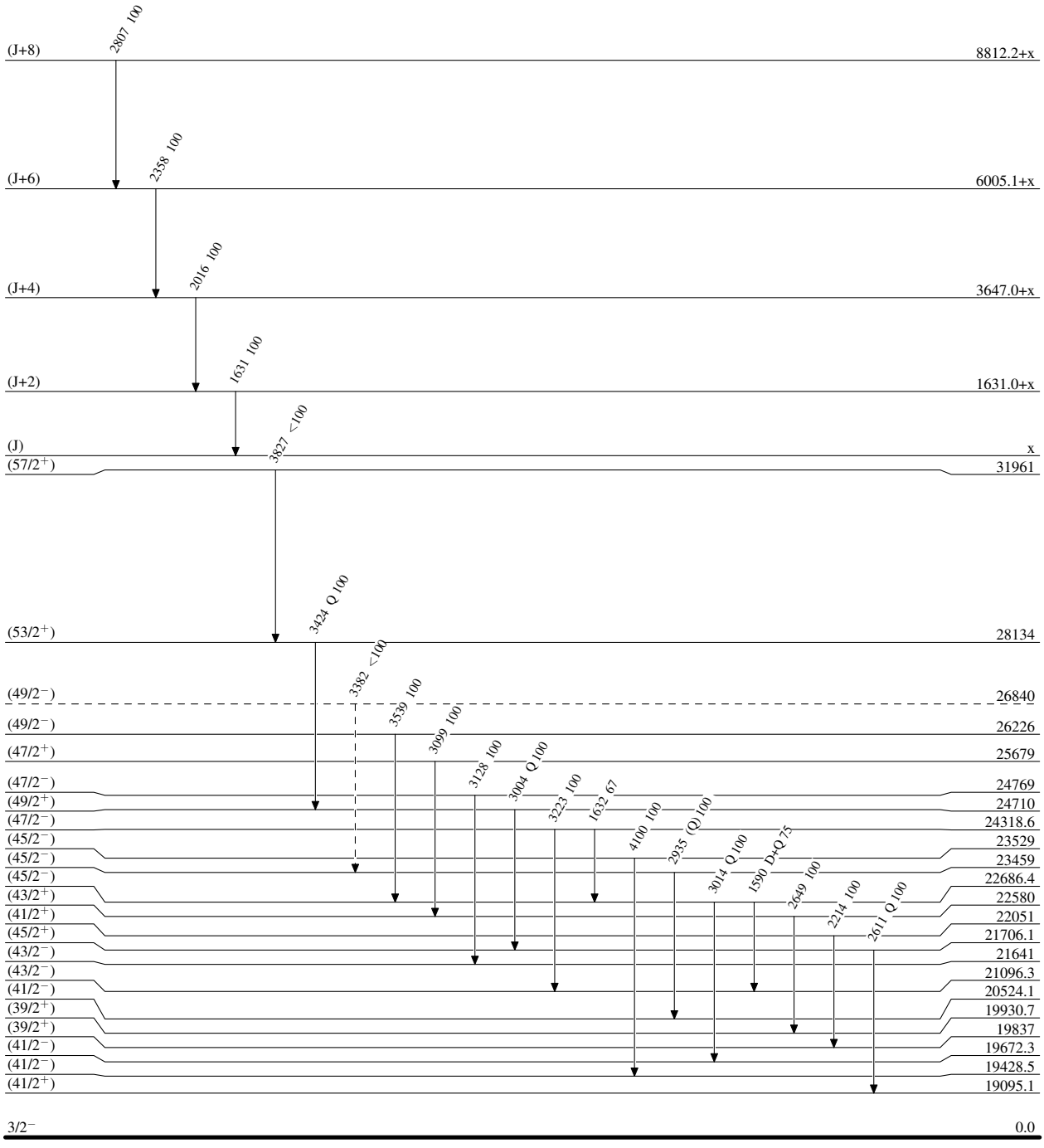
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

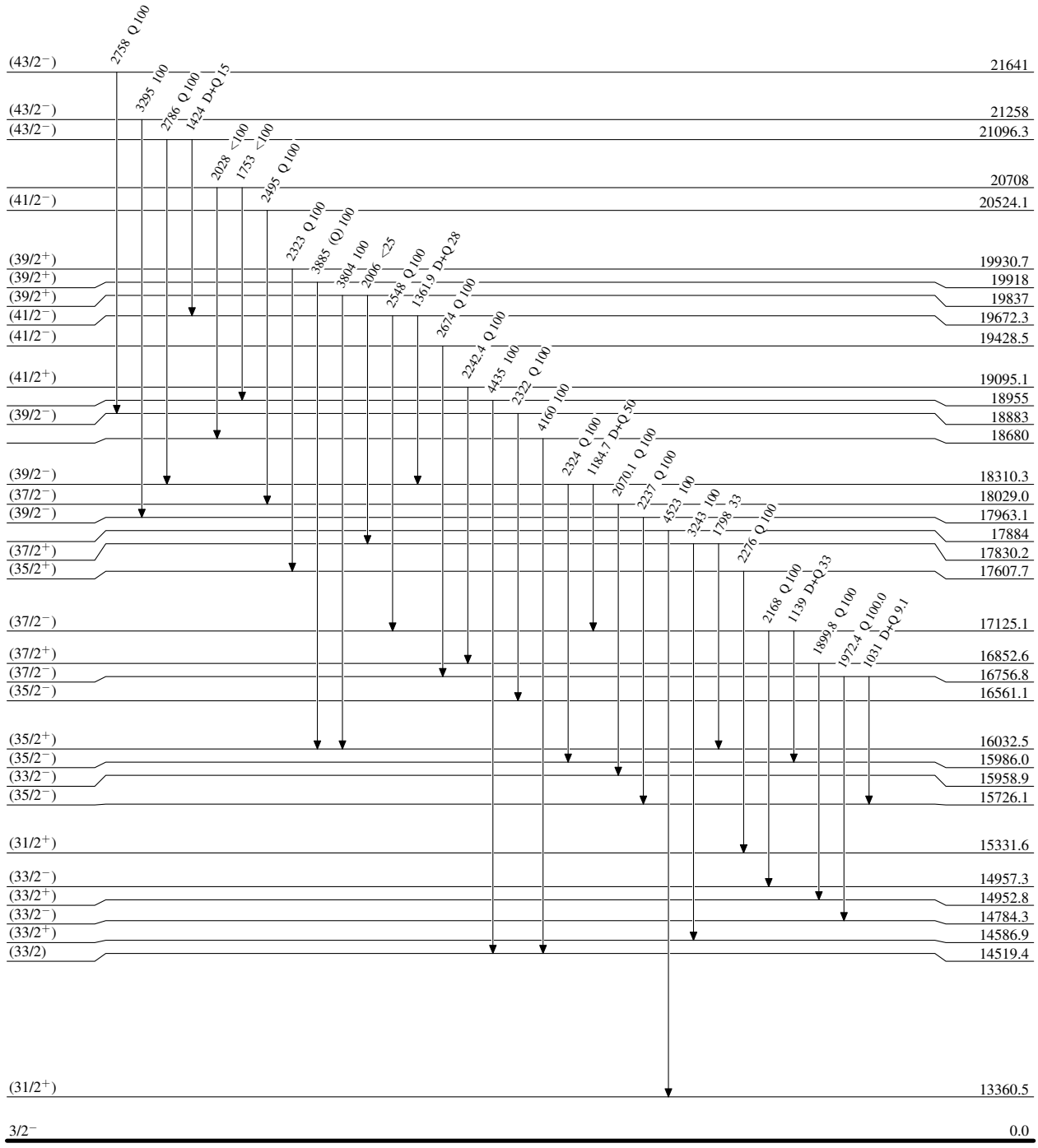


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

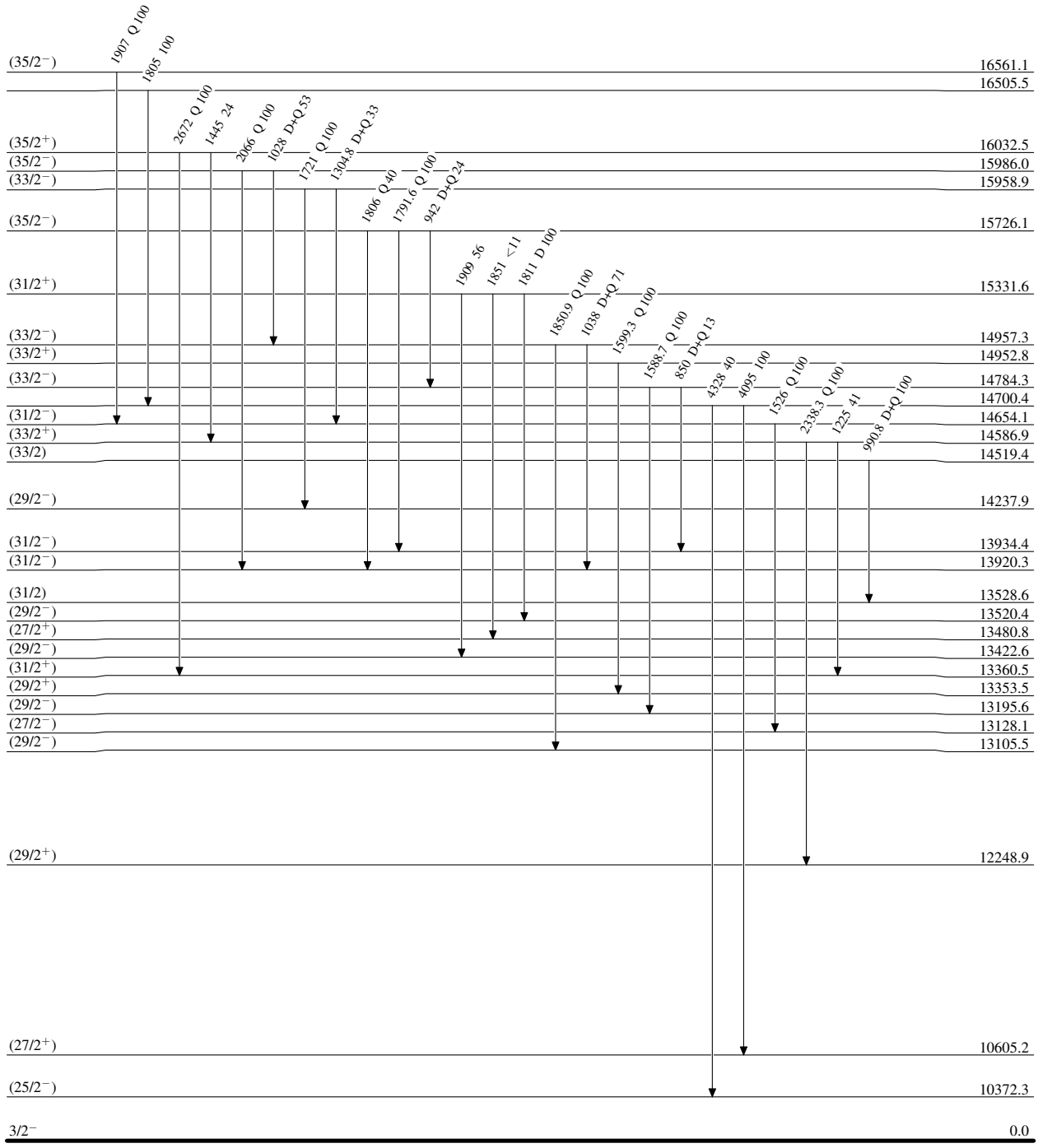


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

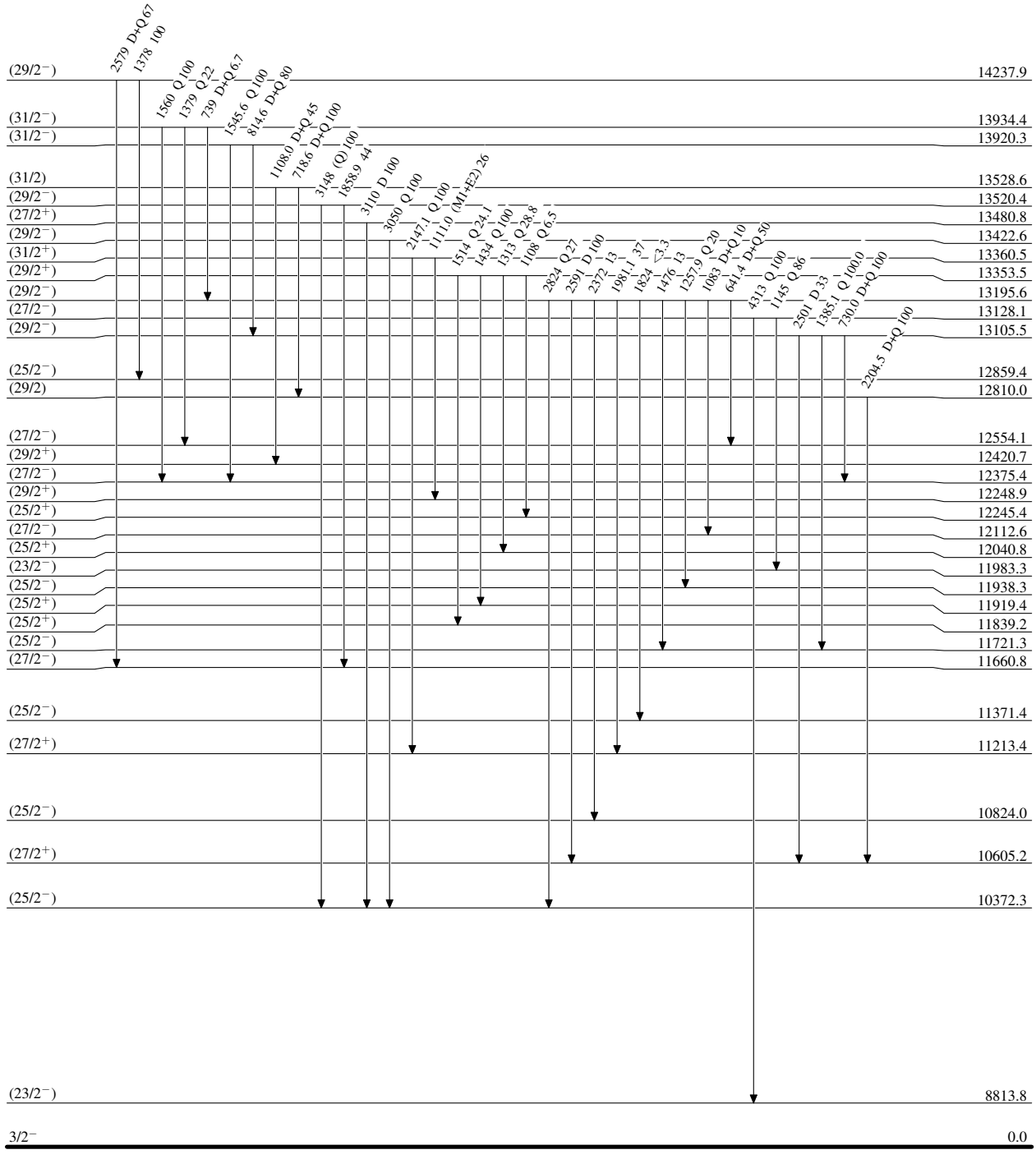


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

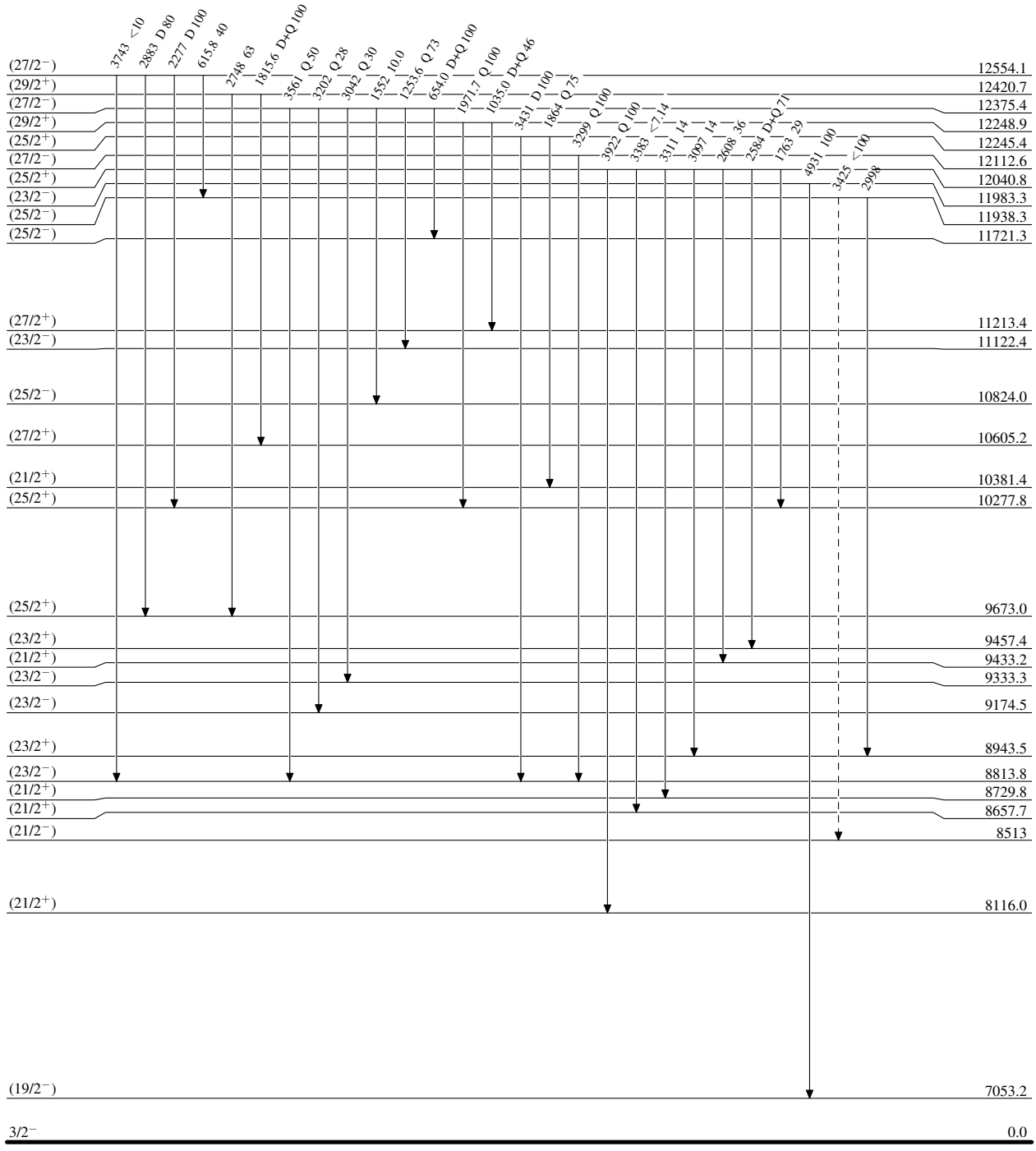
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

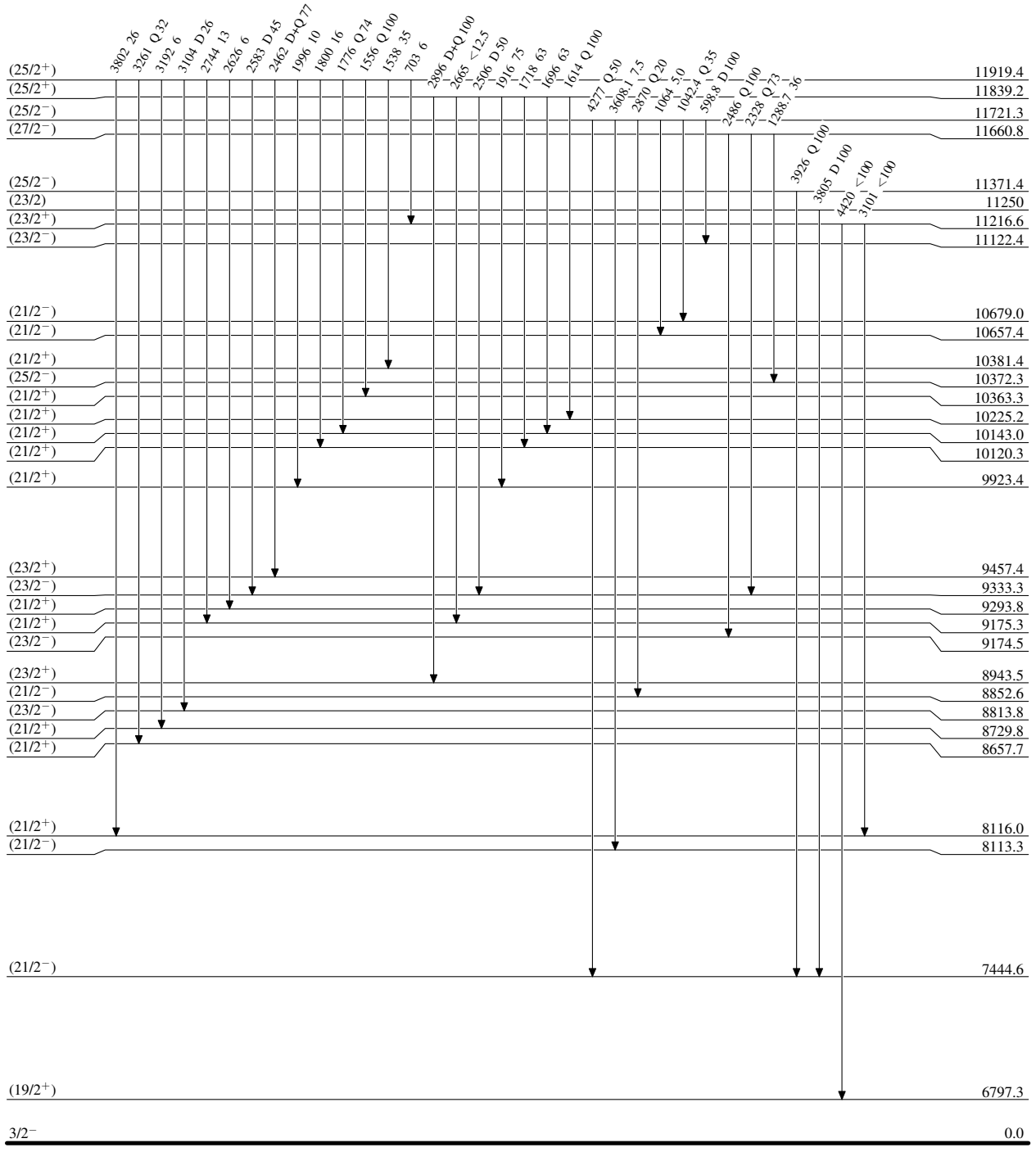


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

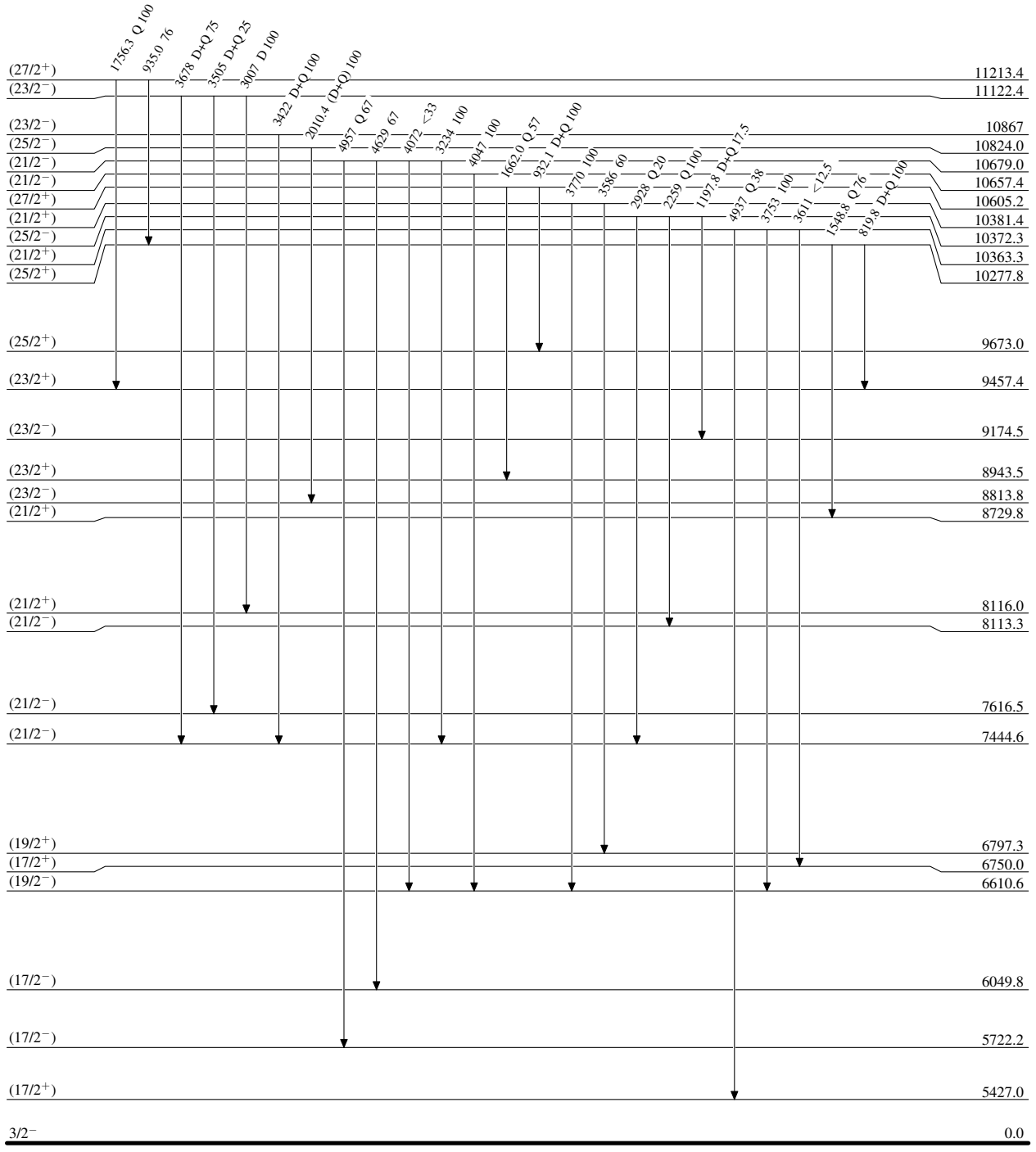


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

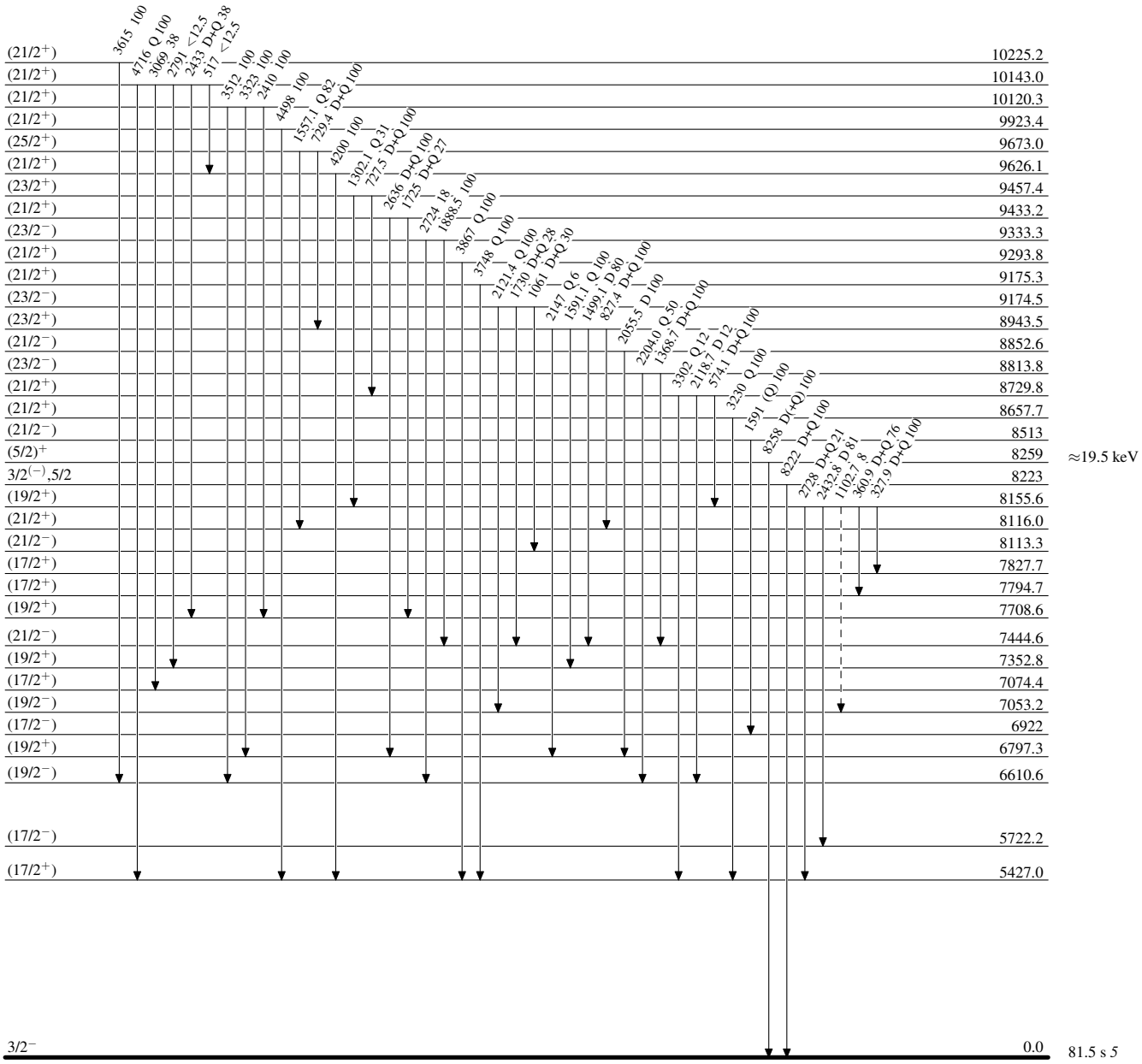
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{59}_{29}Cu_{30}$

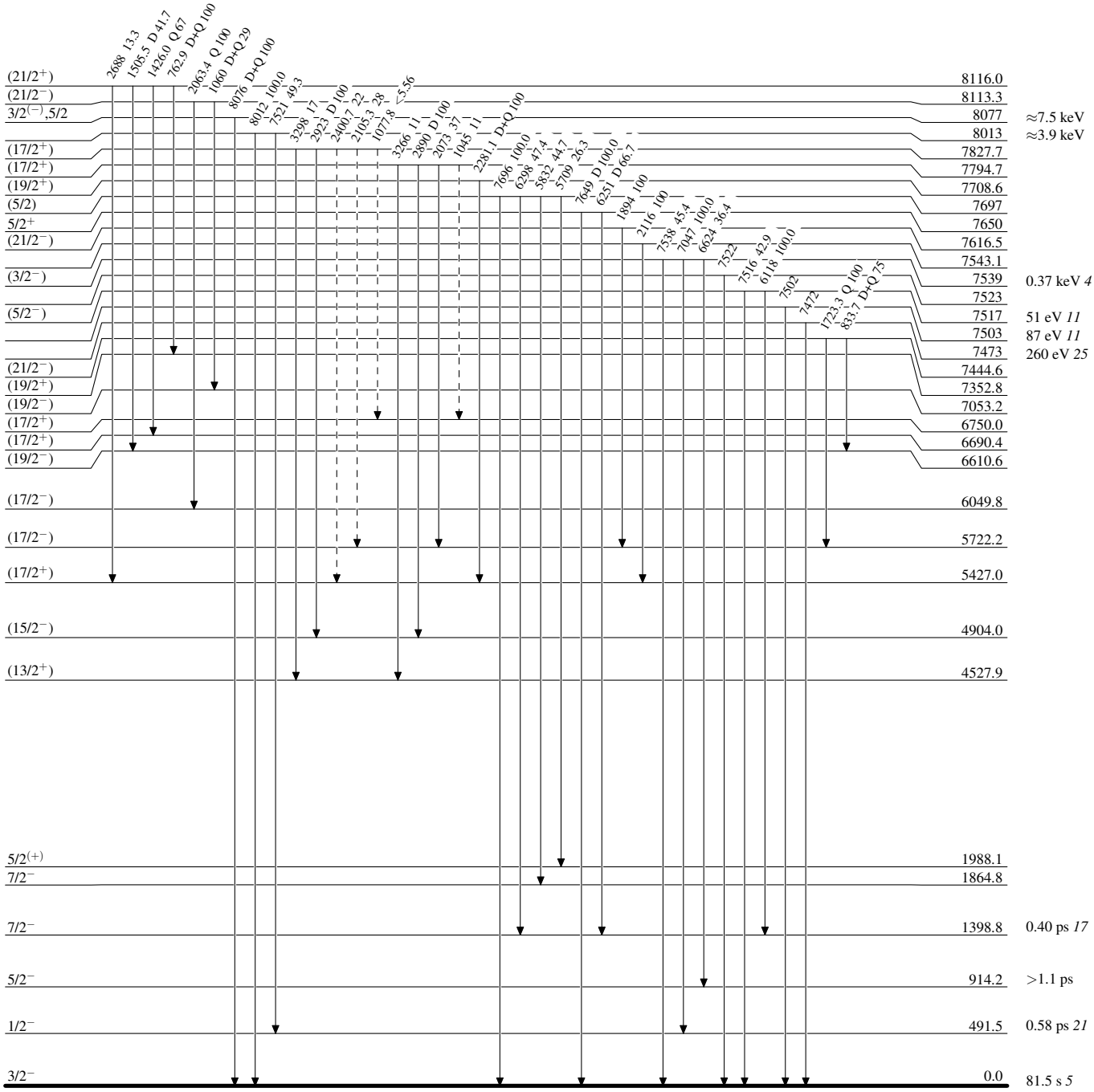
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

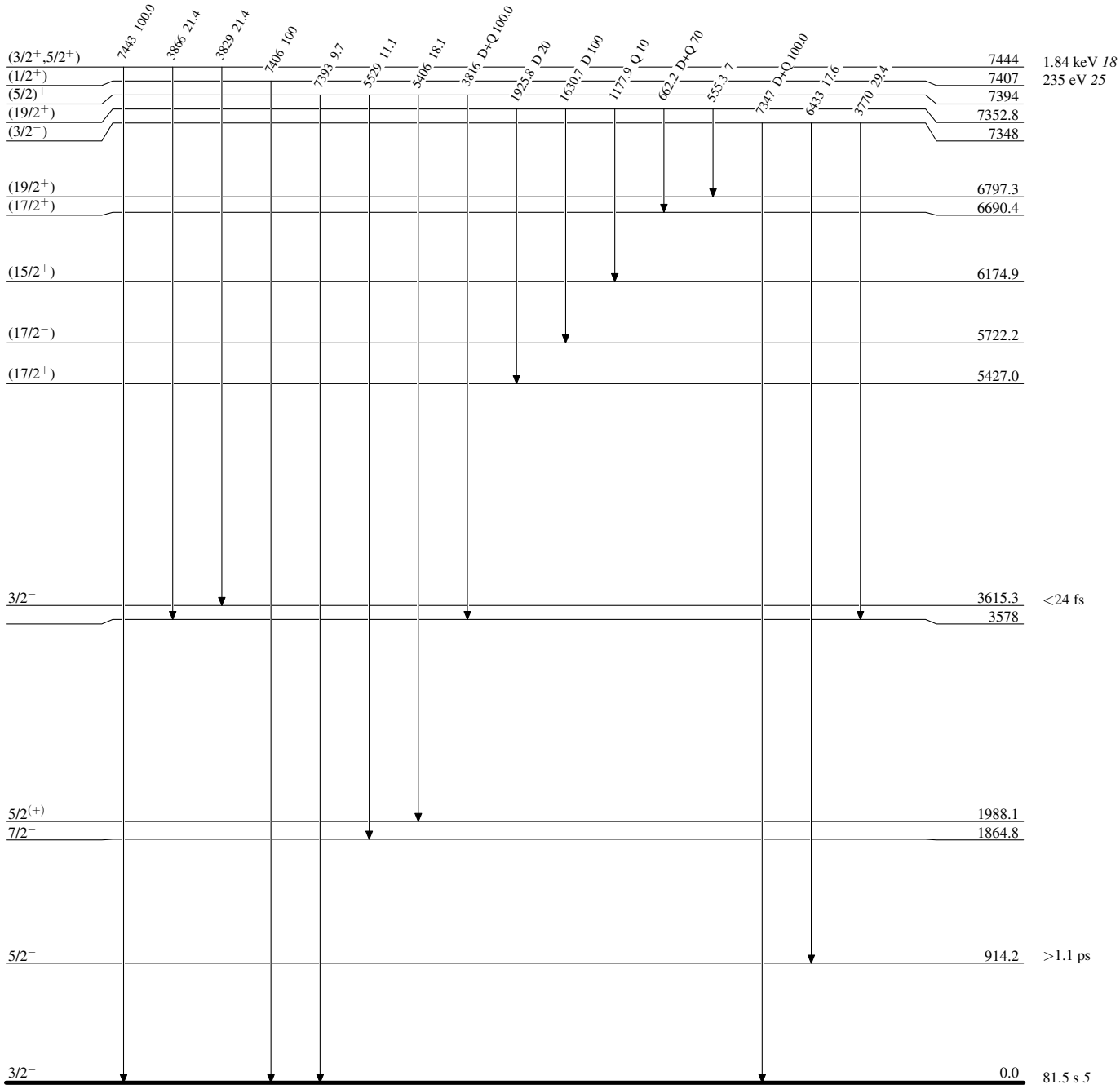


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

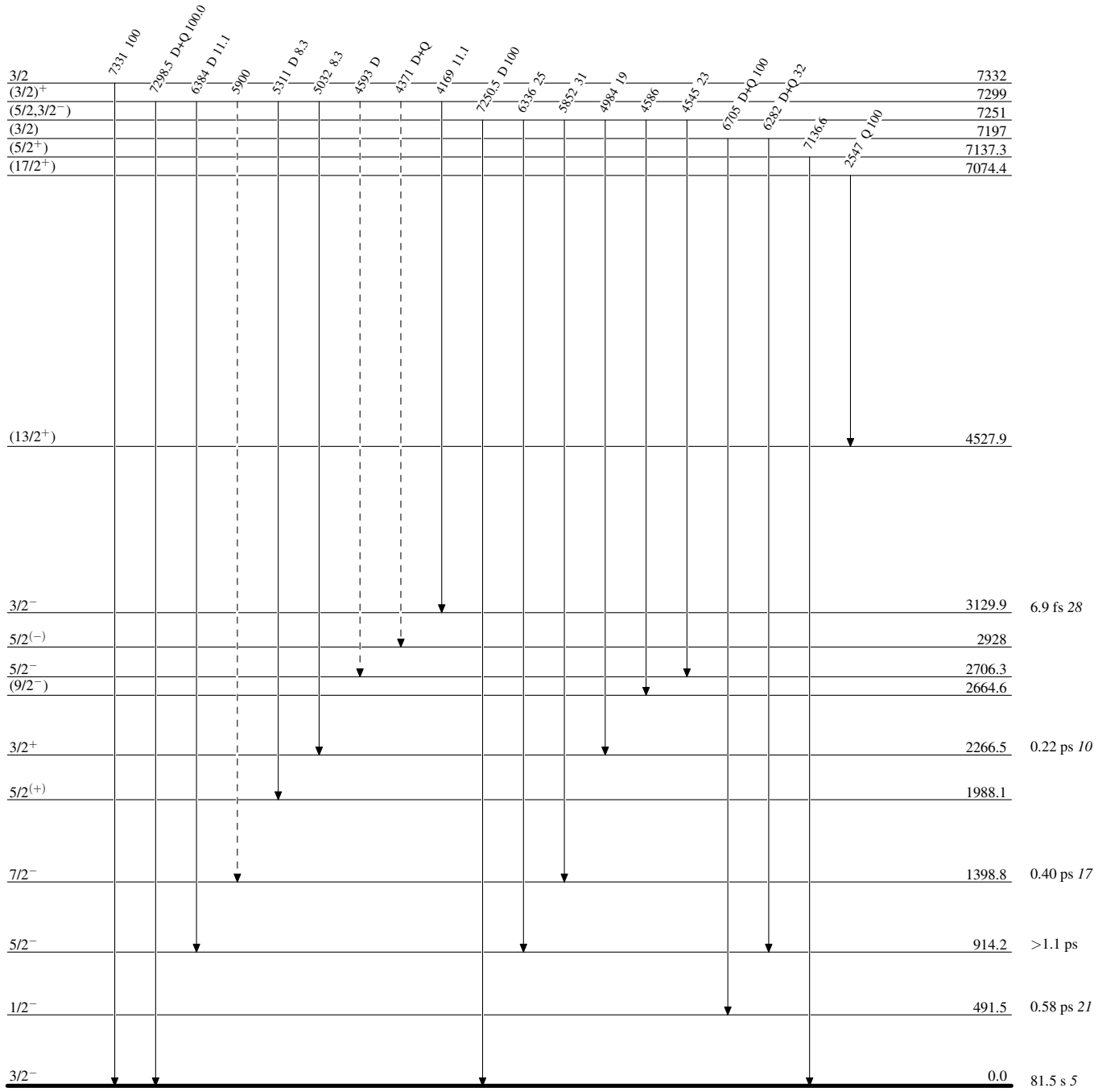
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

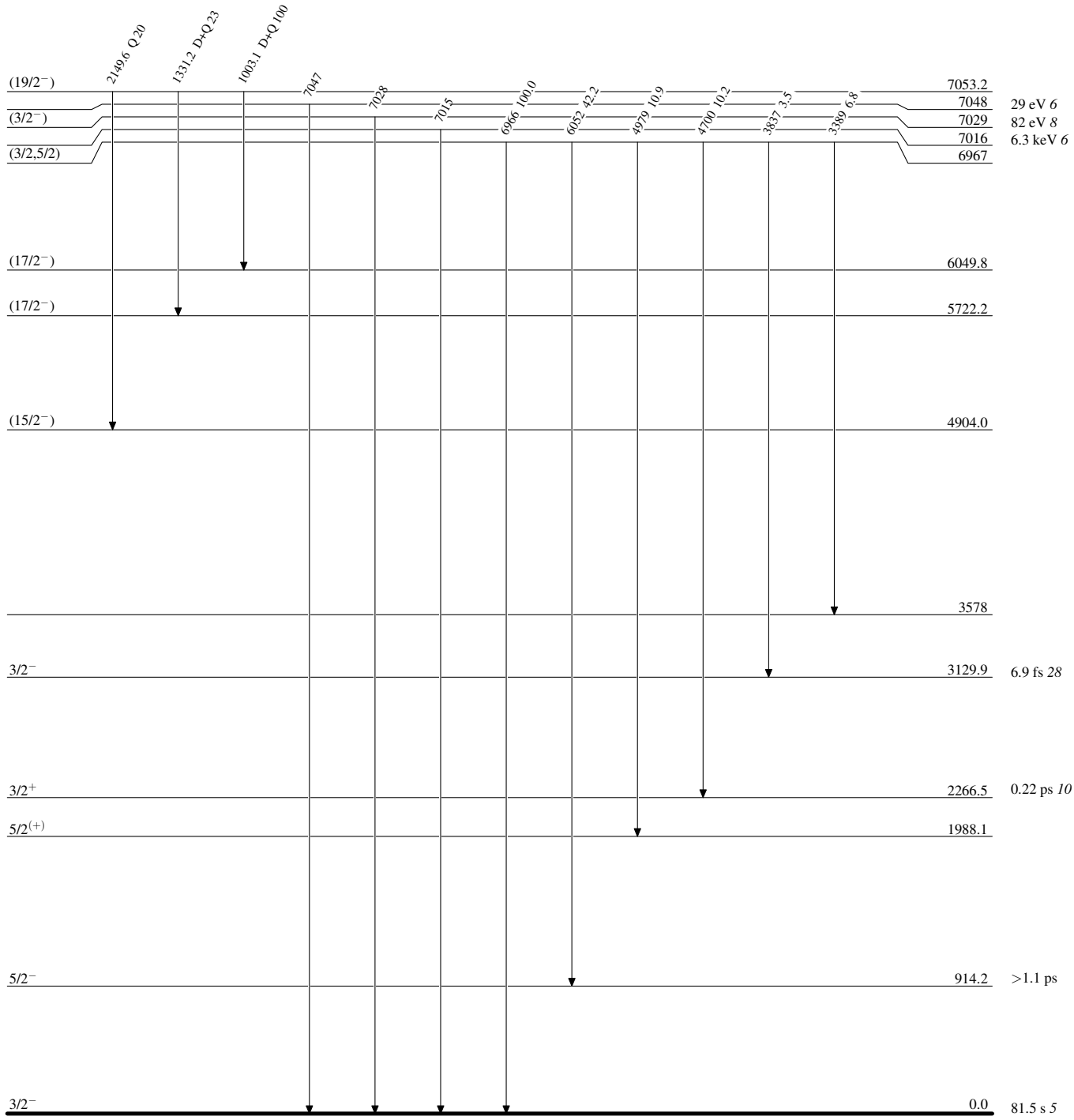


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

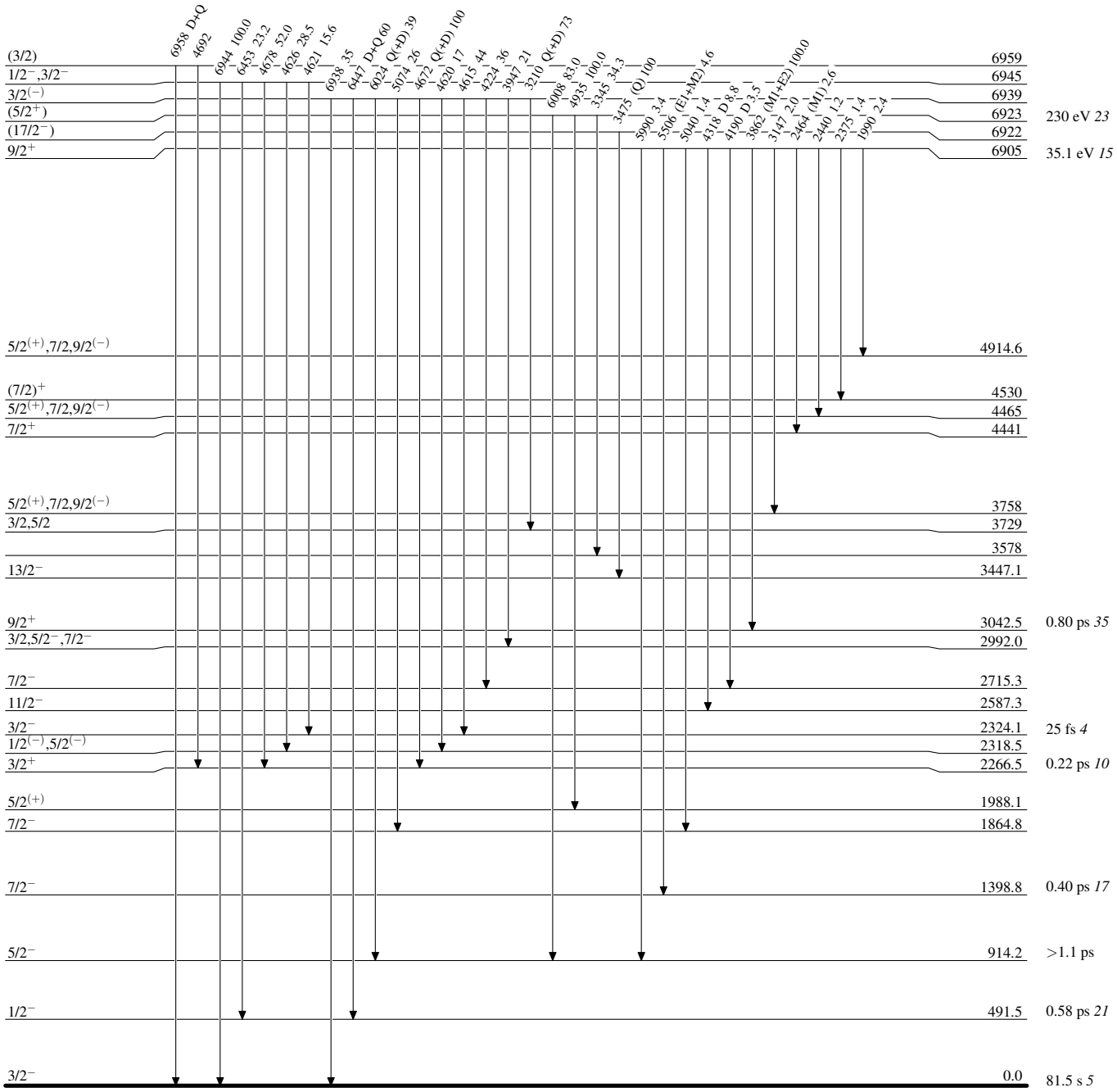


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

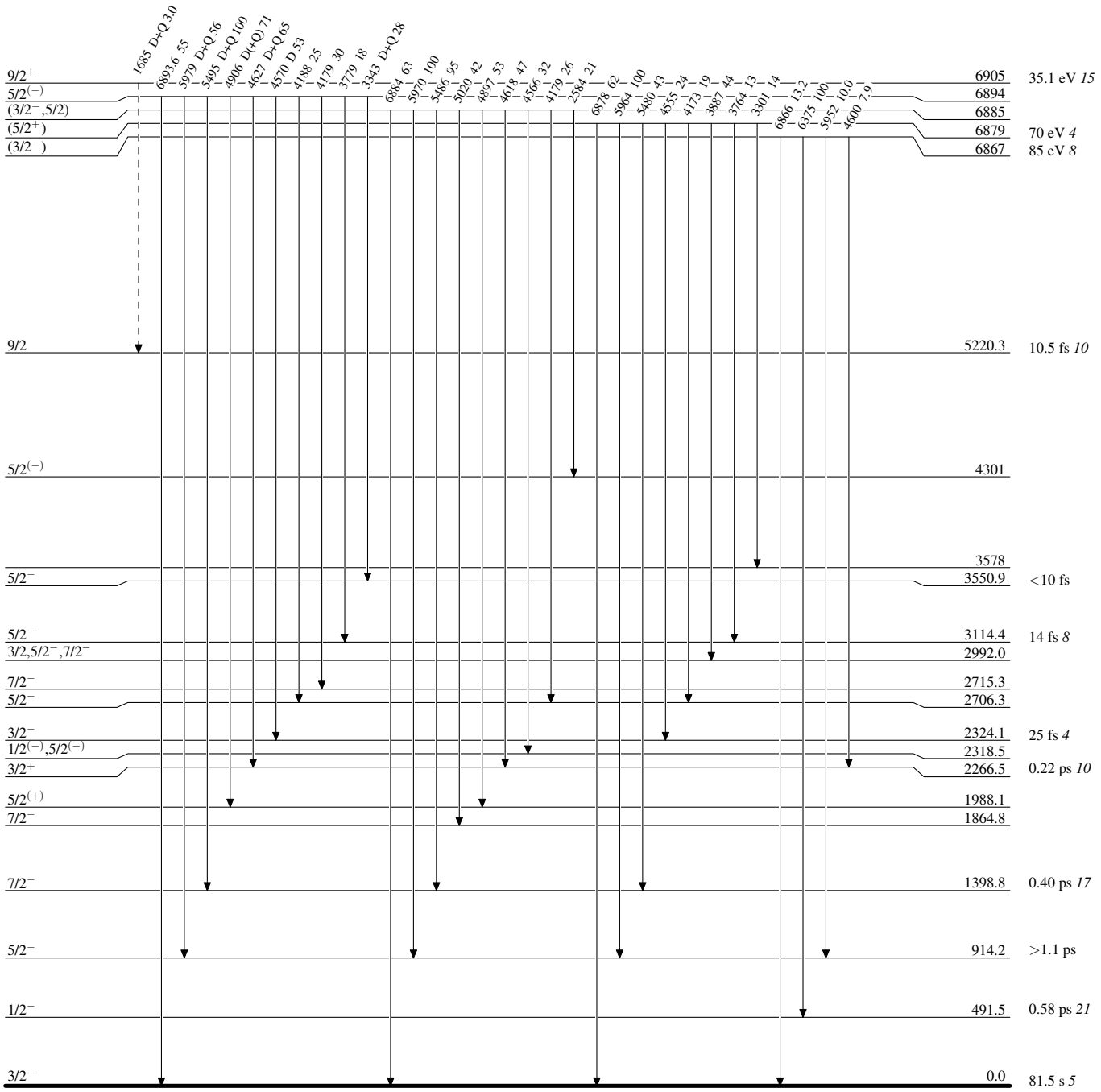
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

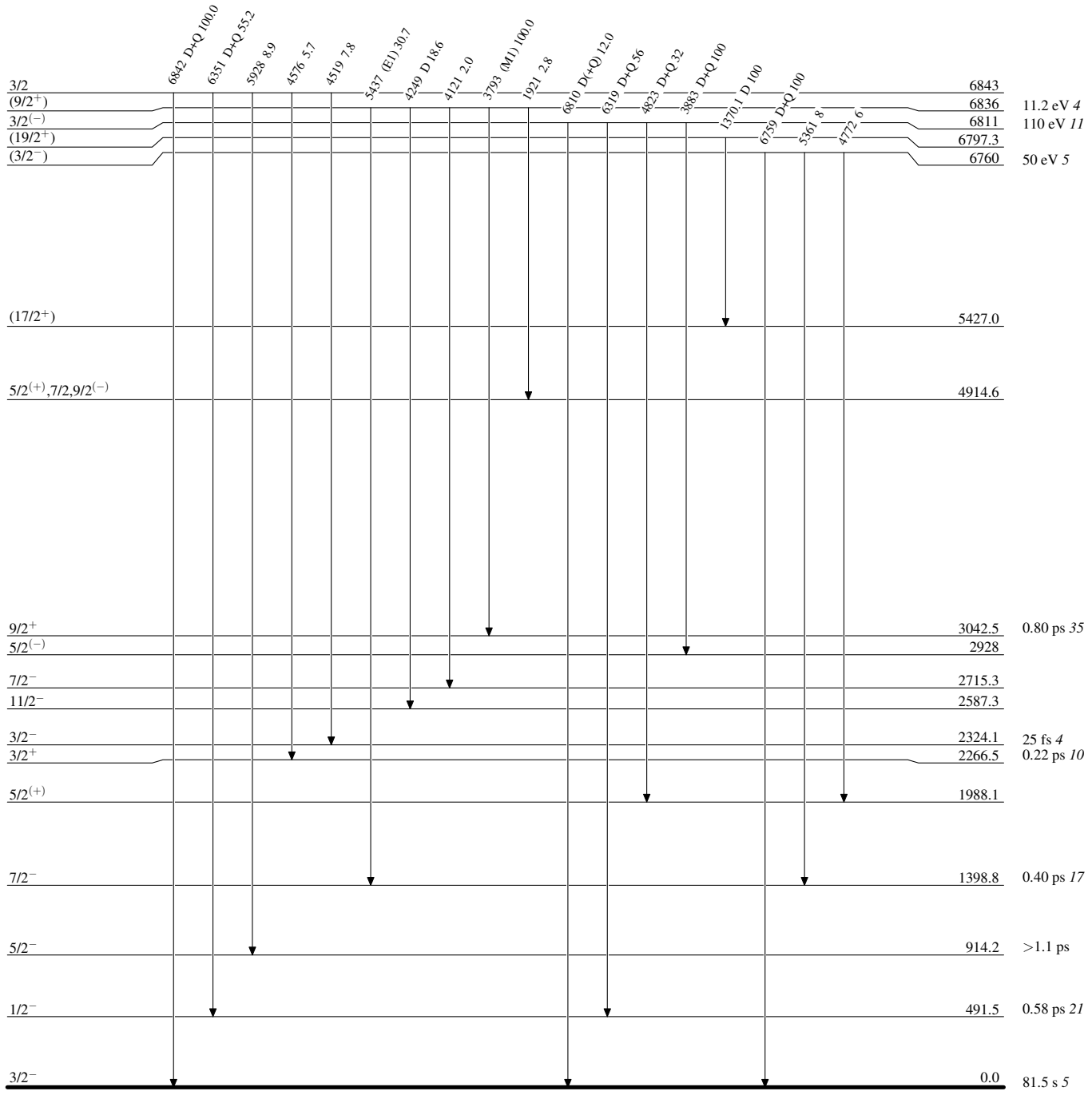


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

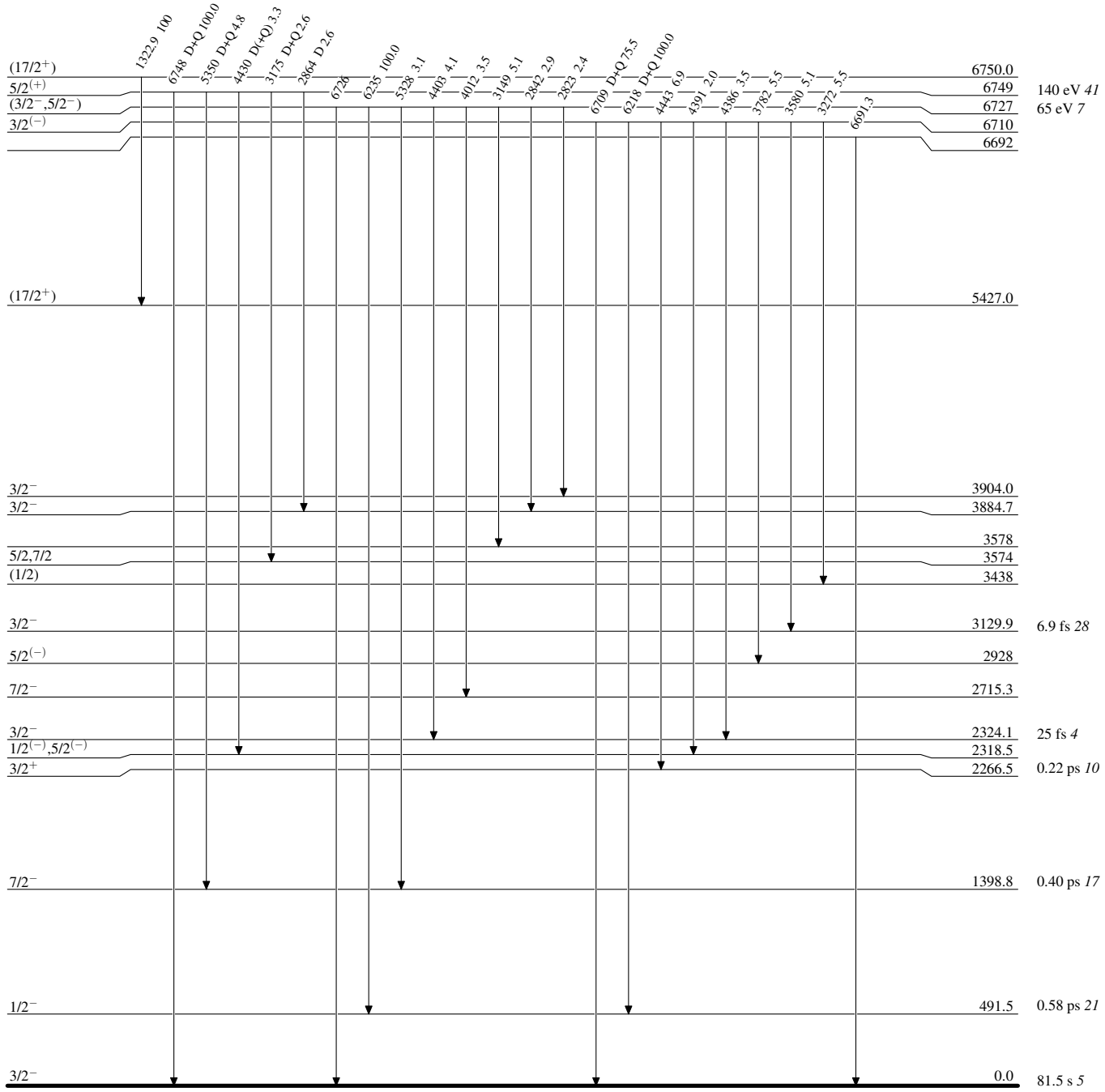


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

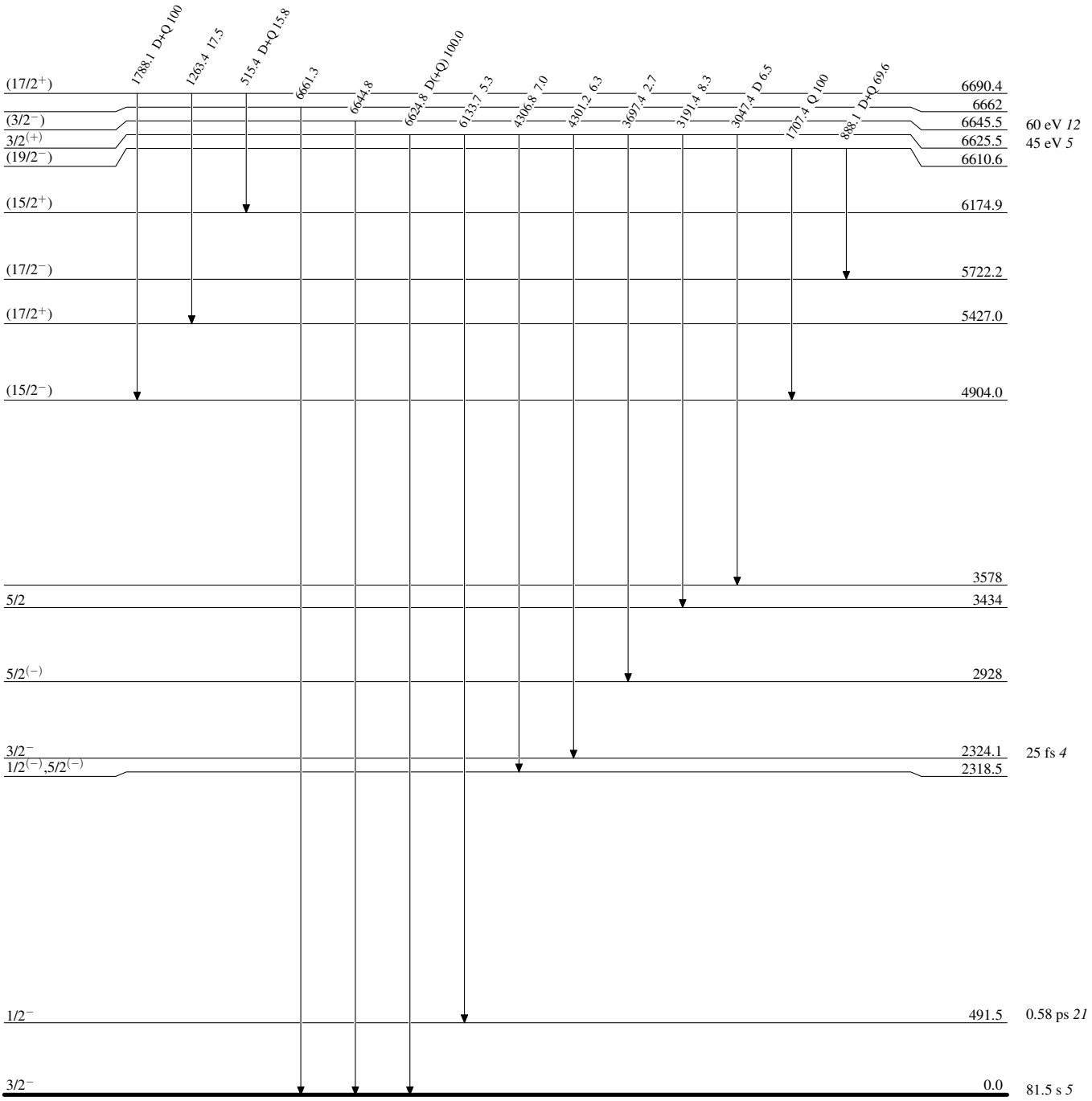


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

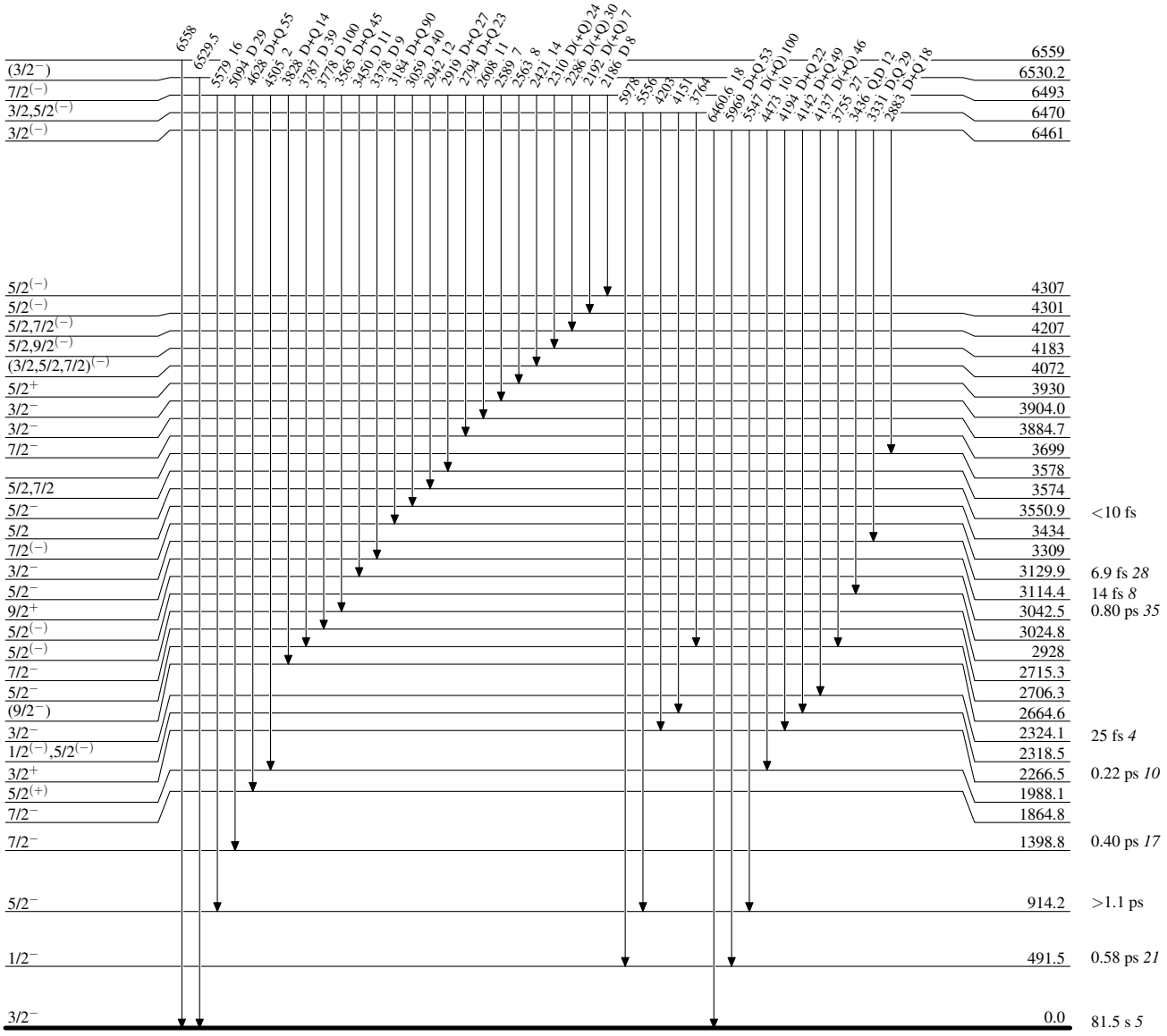


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

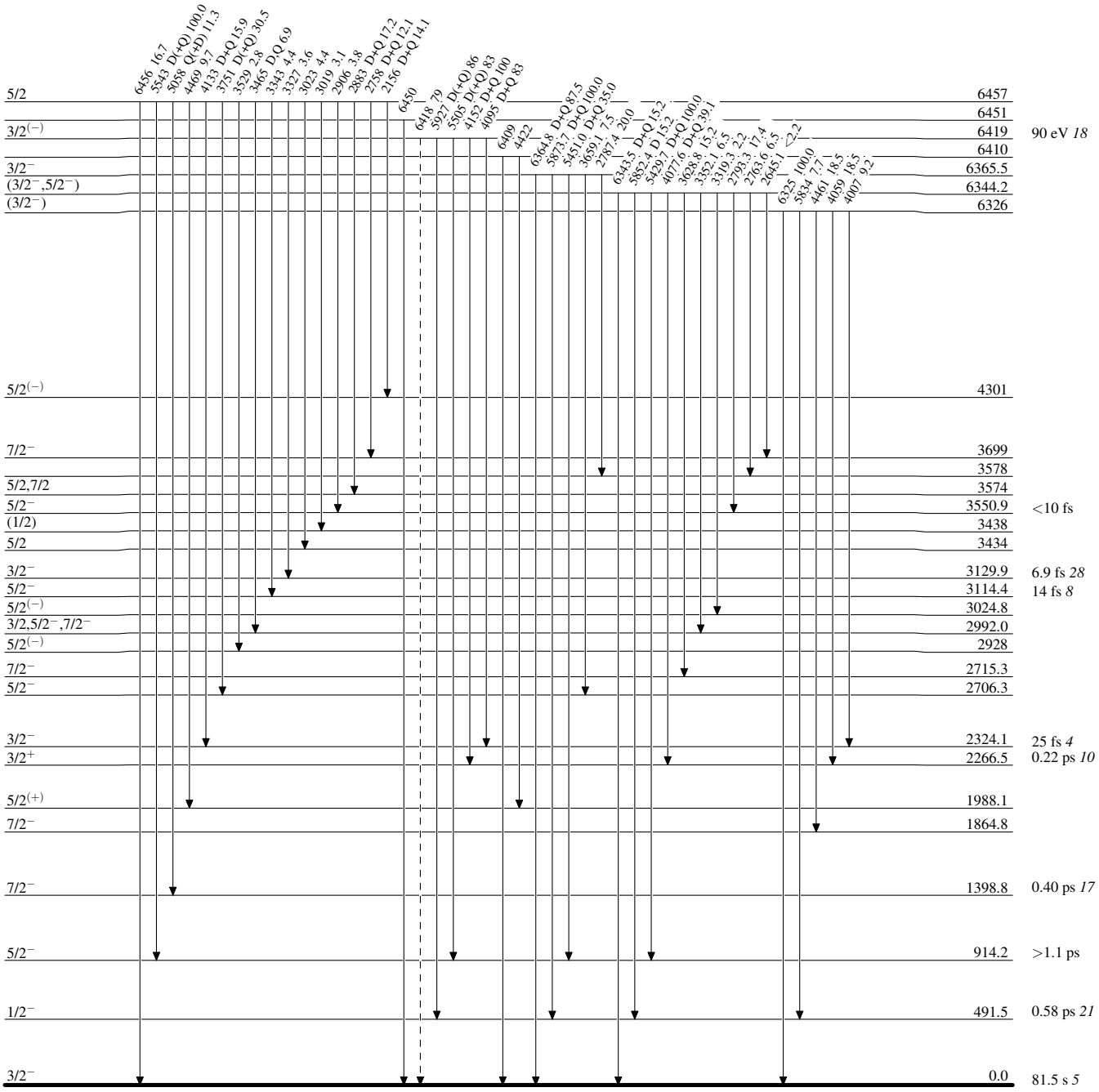
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

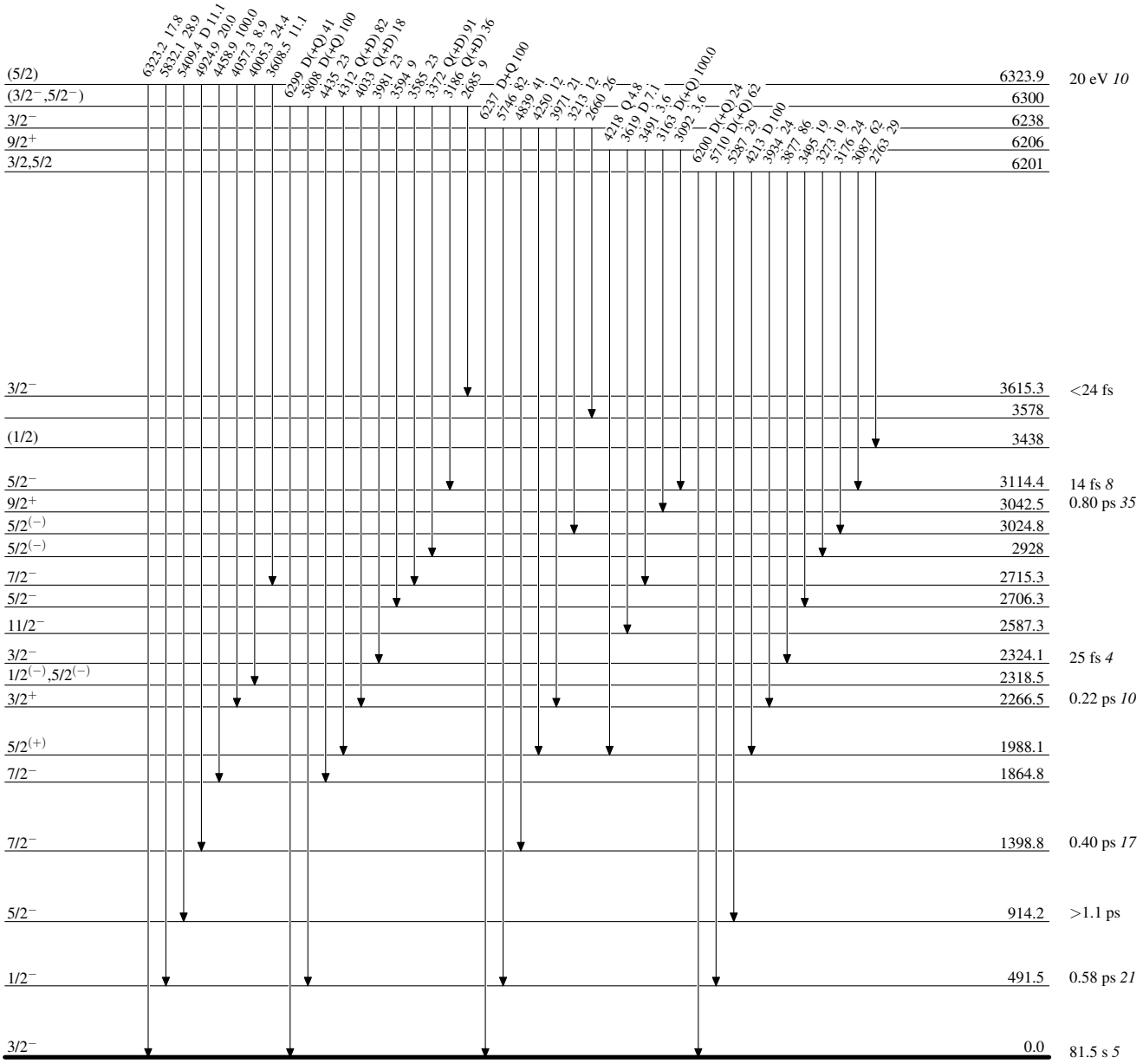


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

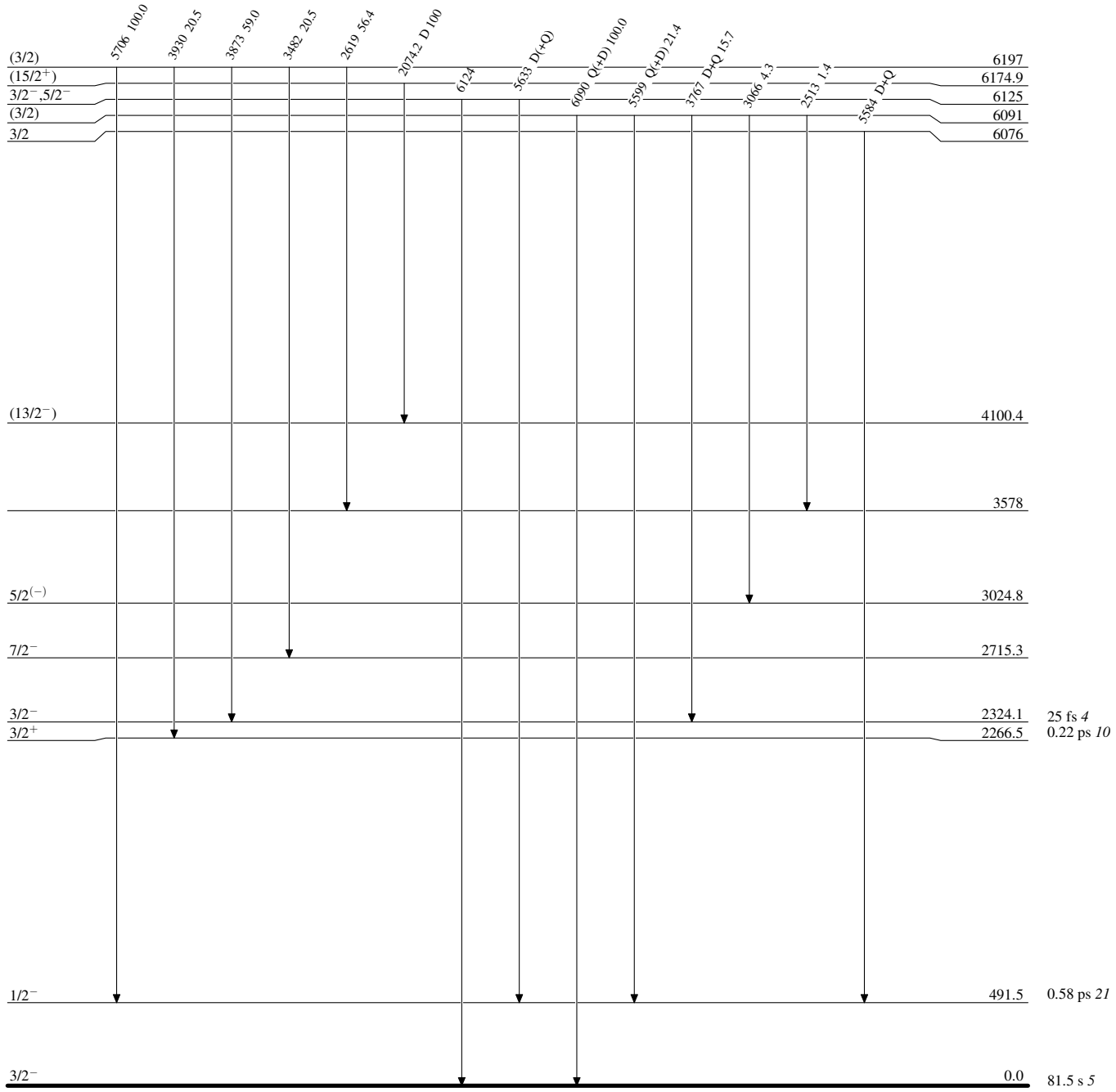


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



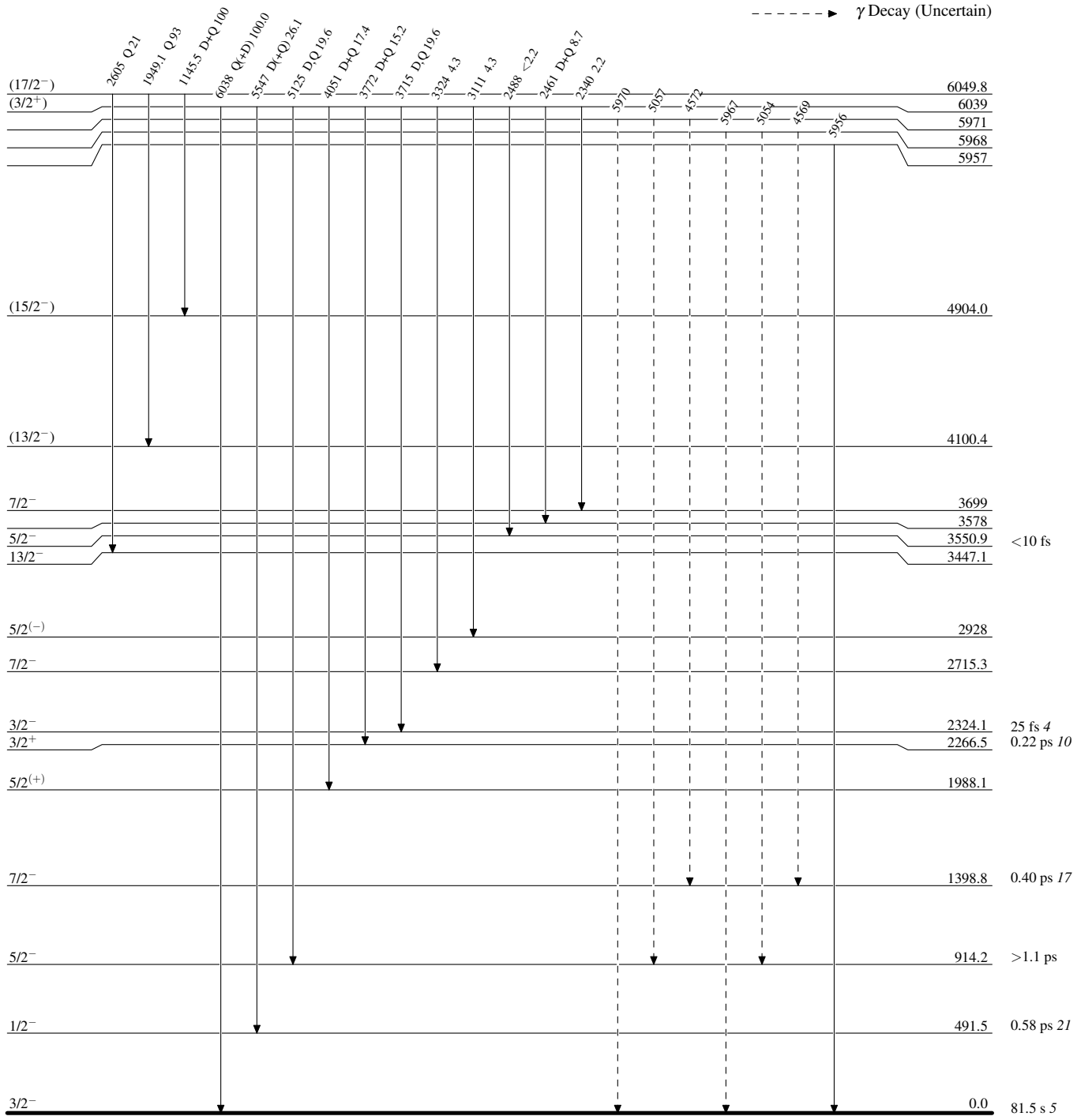
$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Legend

Intensities: Relative photon branching from each level

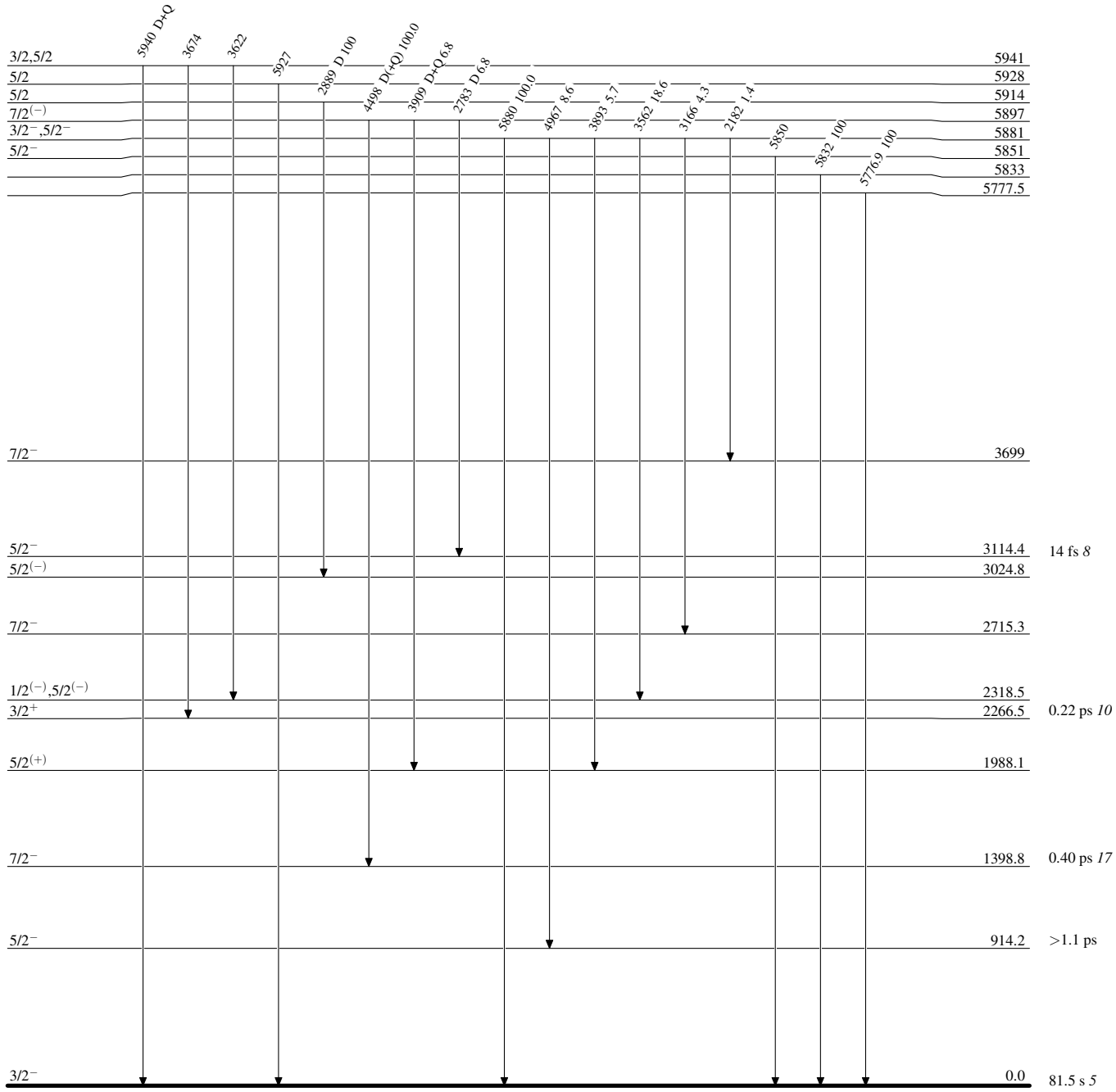


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

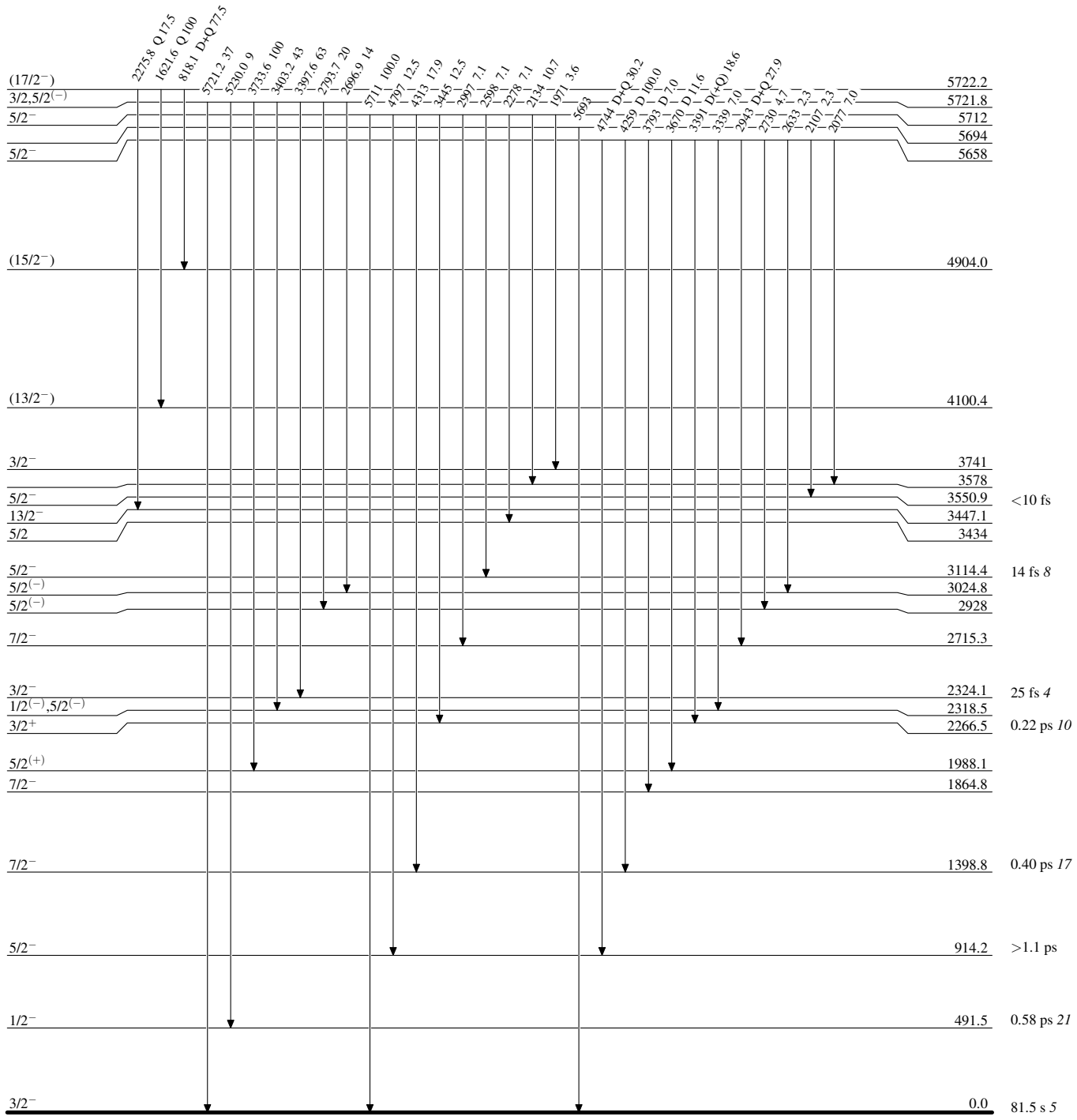


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

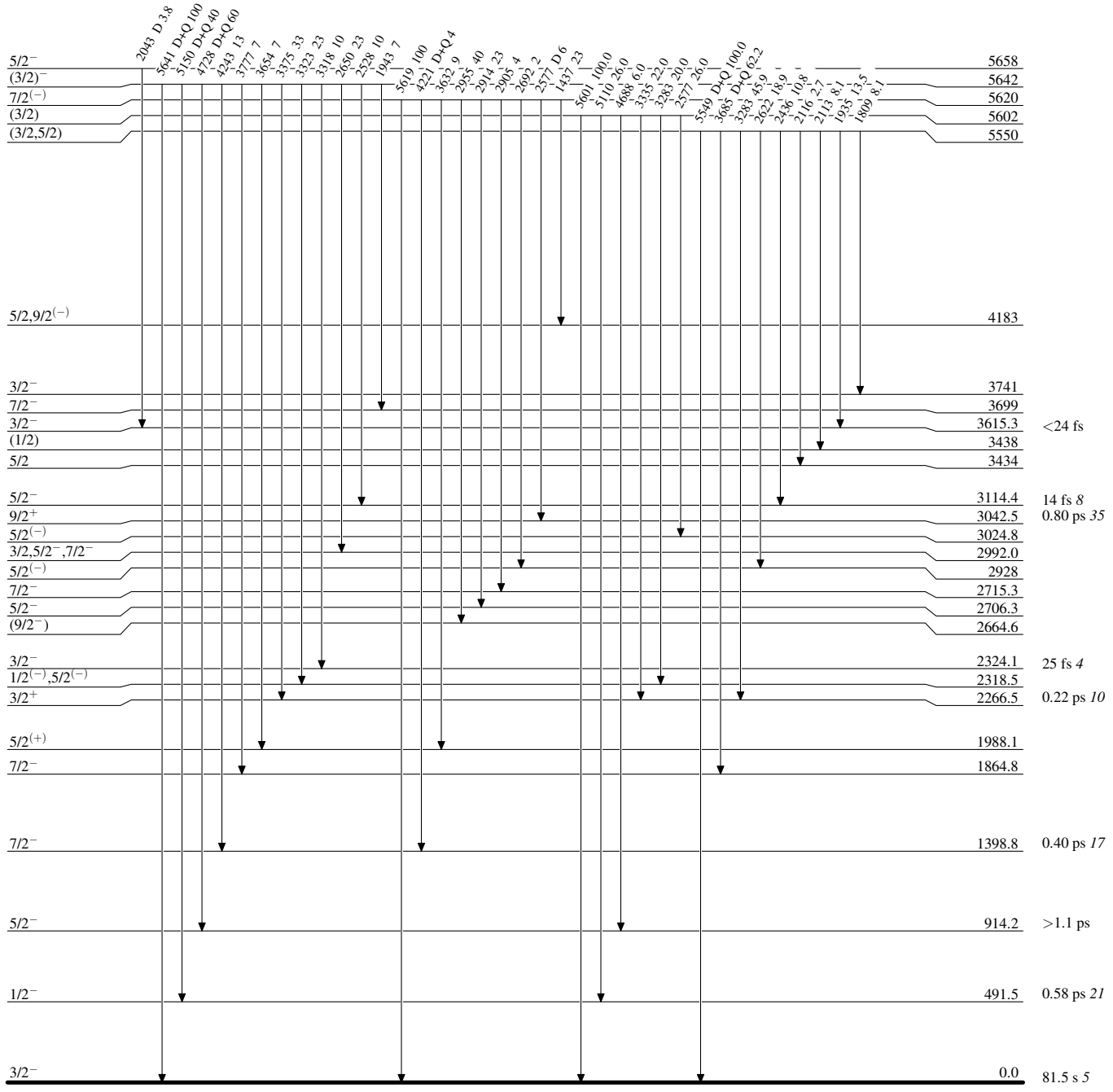


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

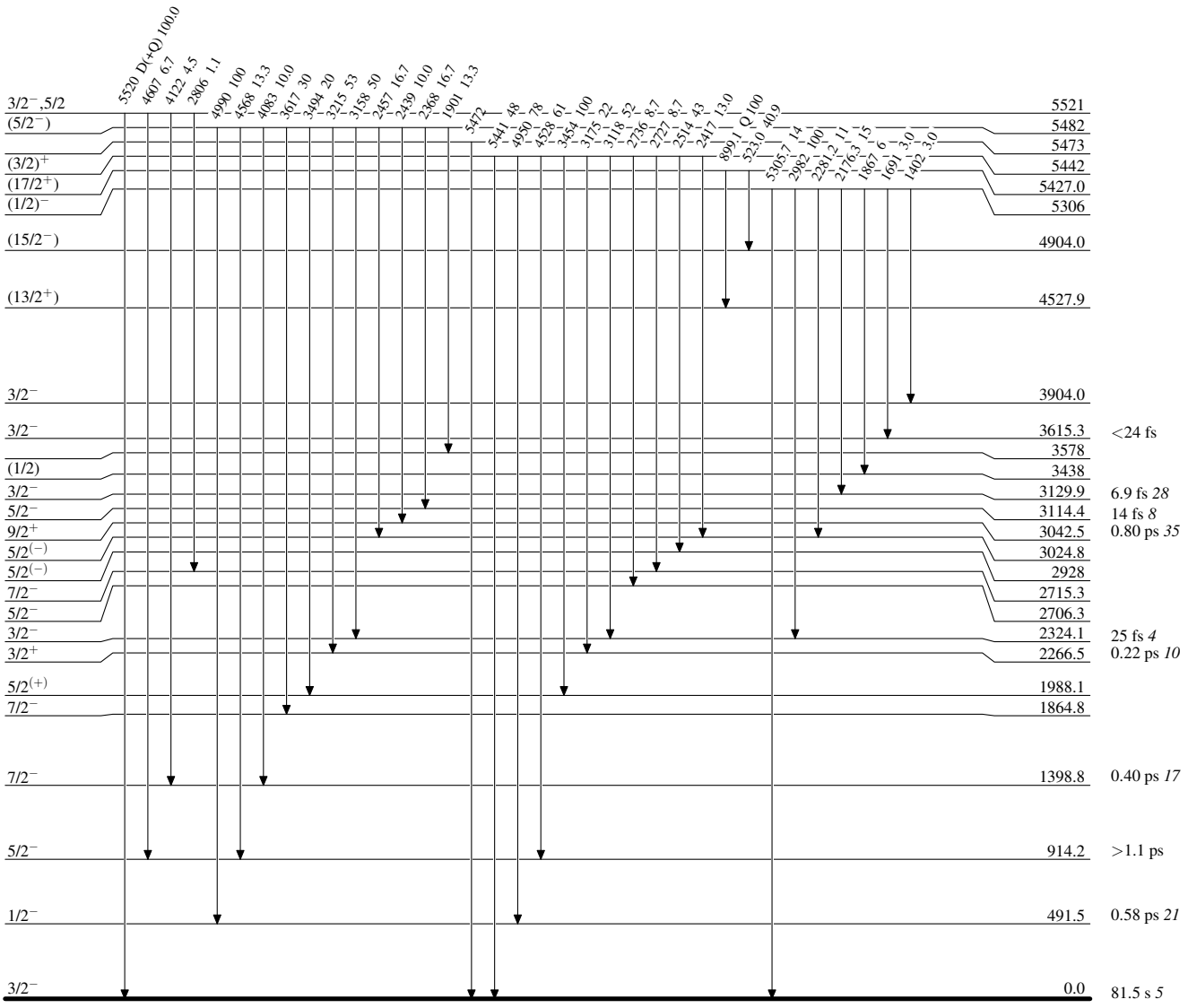


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

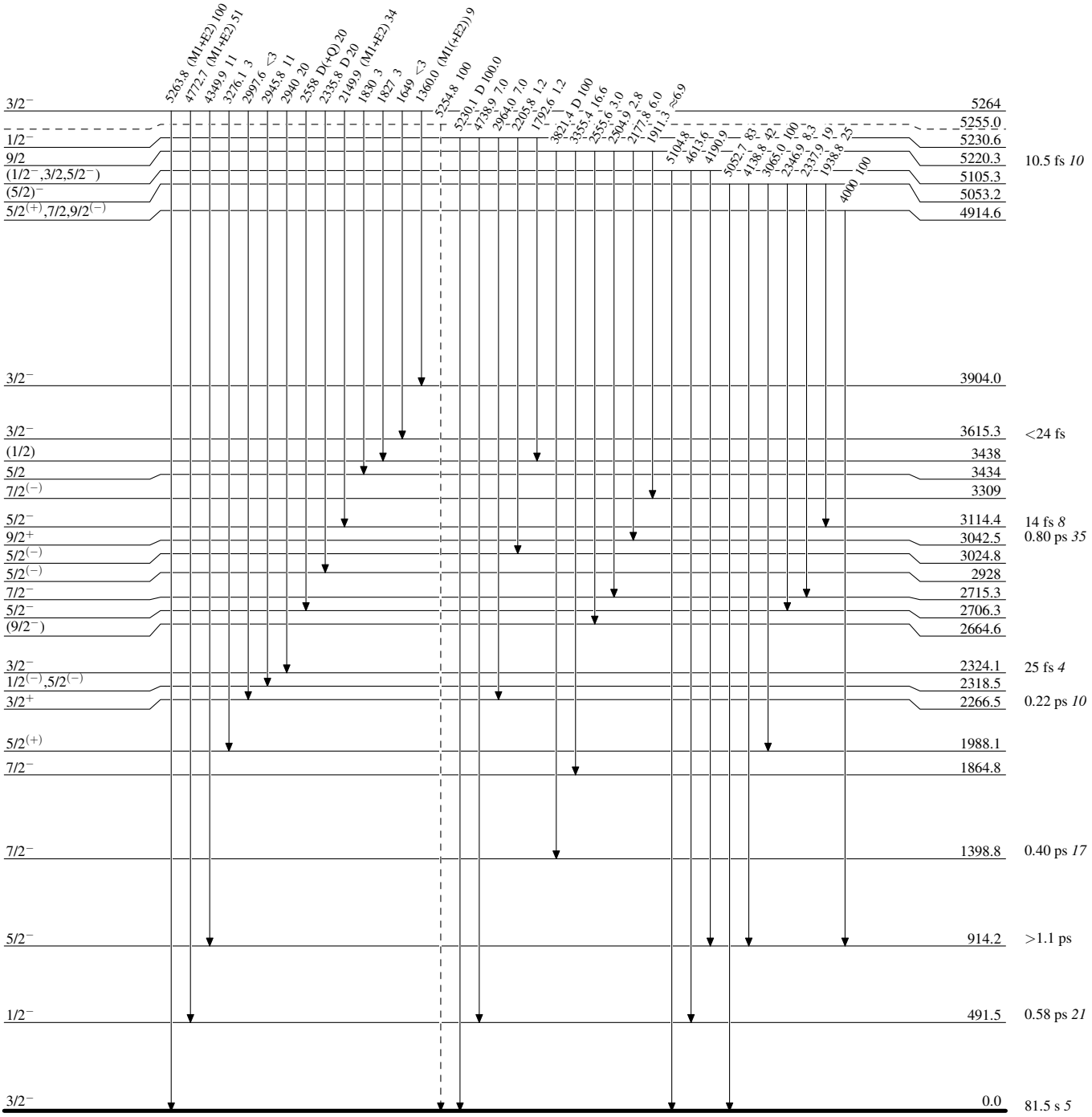
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{59}_{29}Cu_{30}$

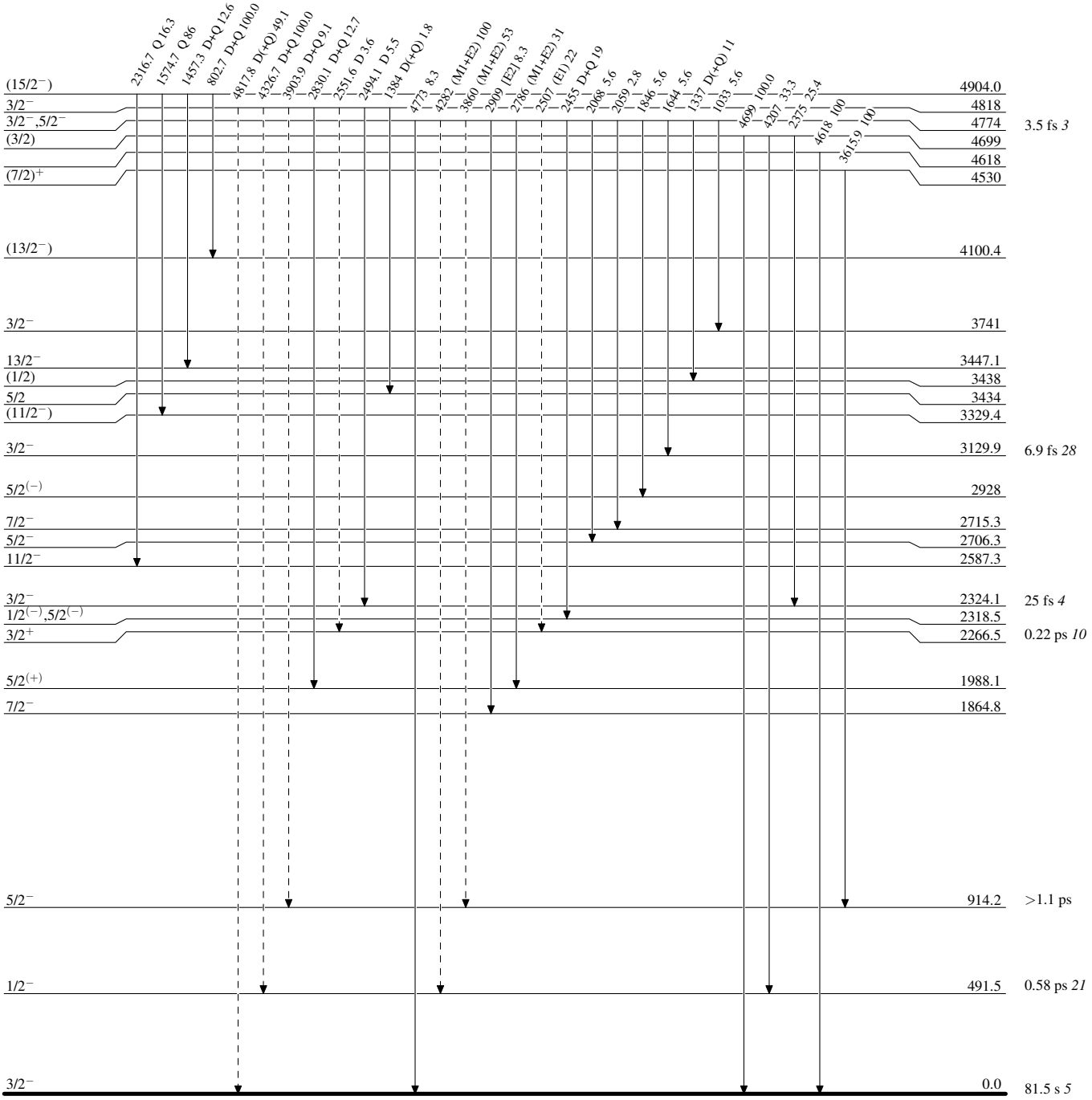
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{59}_{29}Cu_{30}$

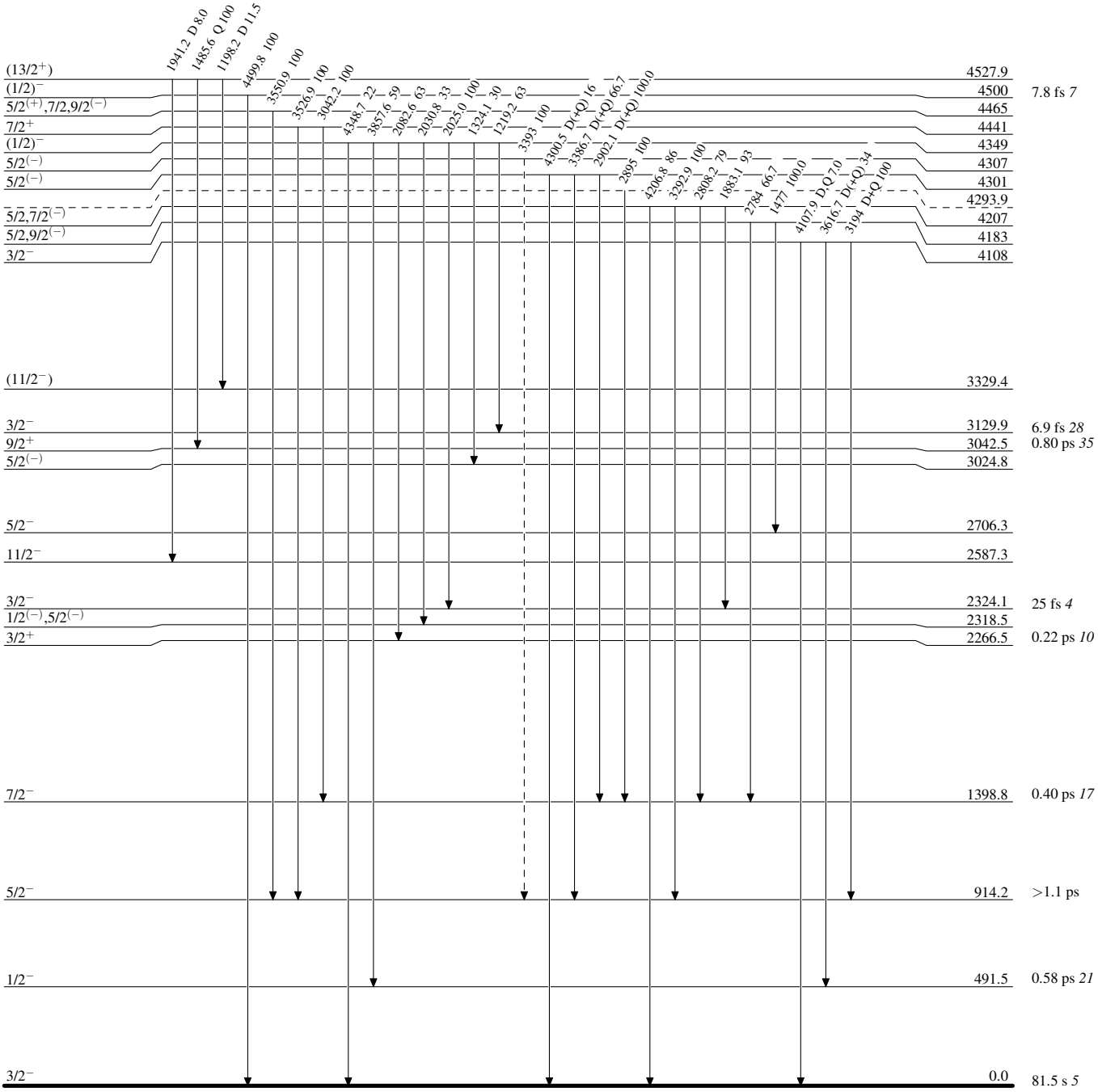
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

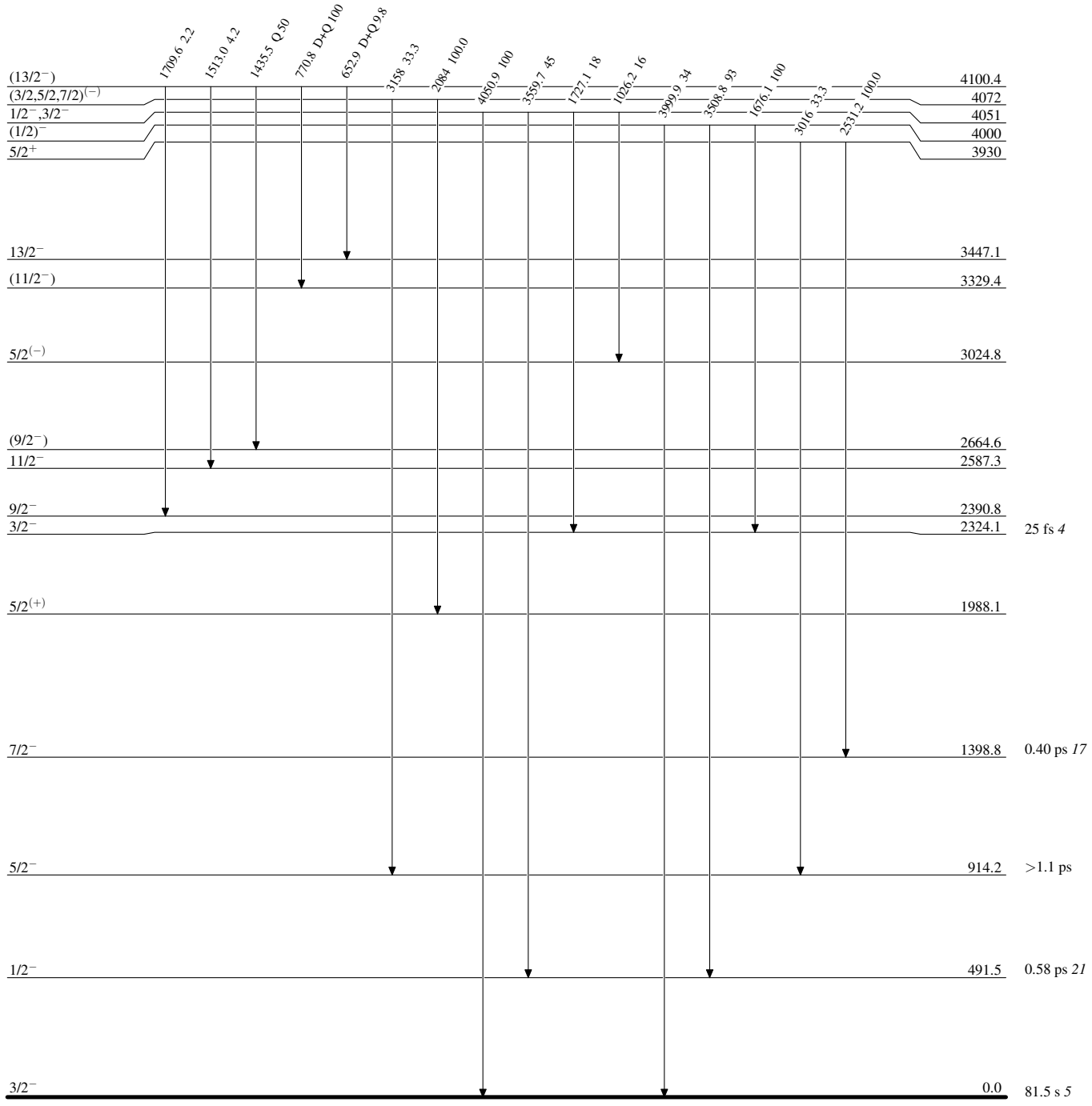


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

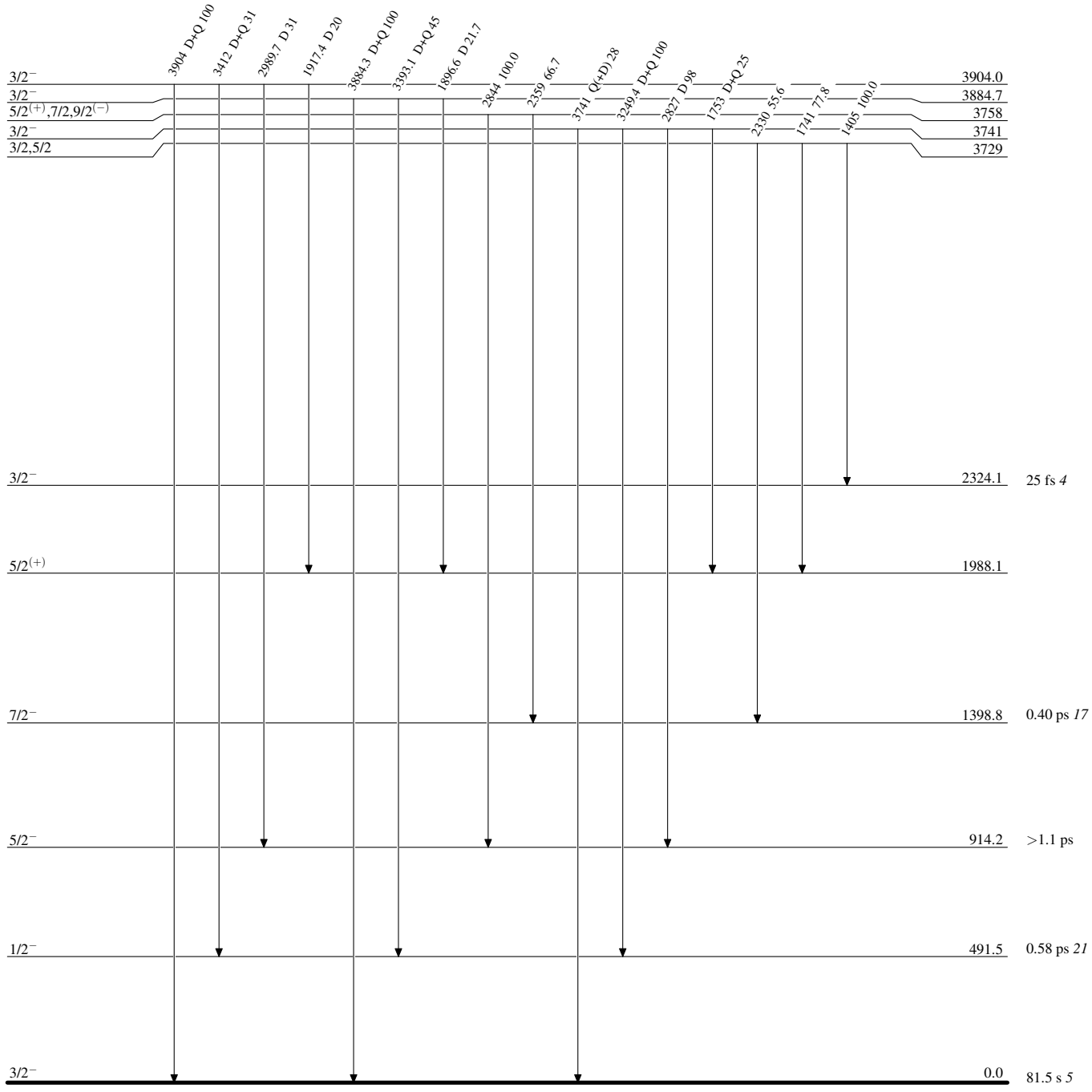


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

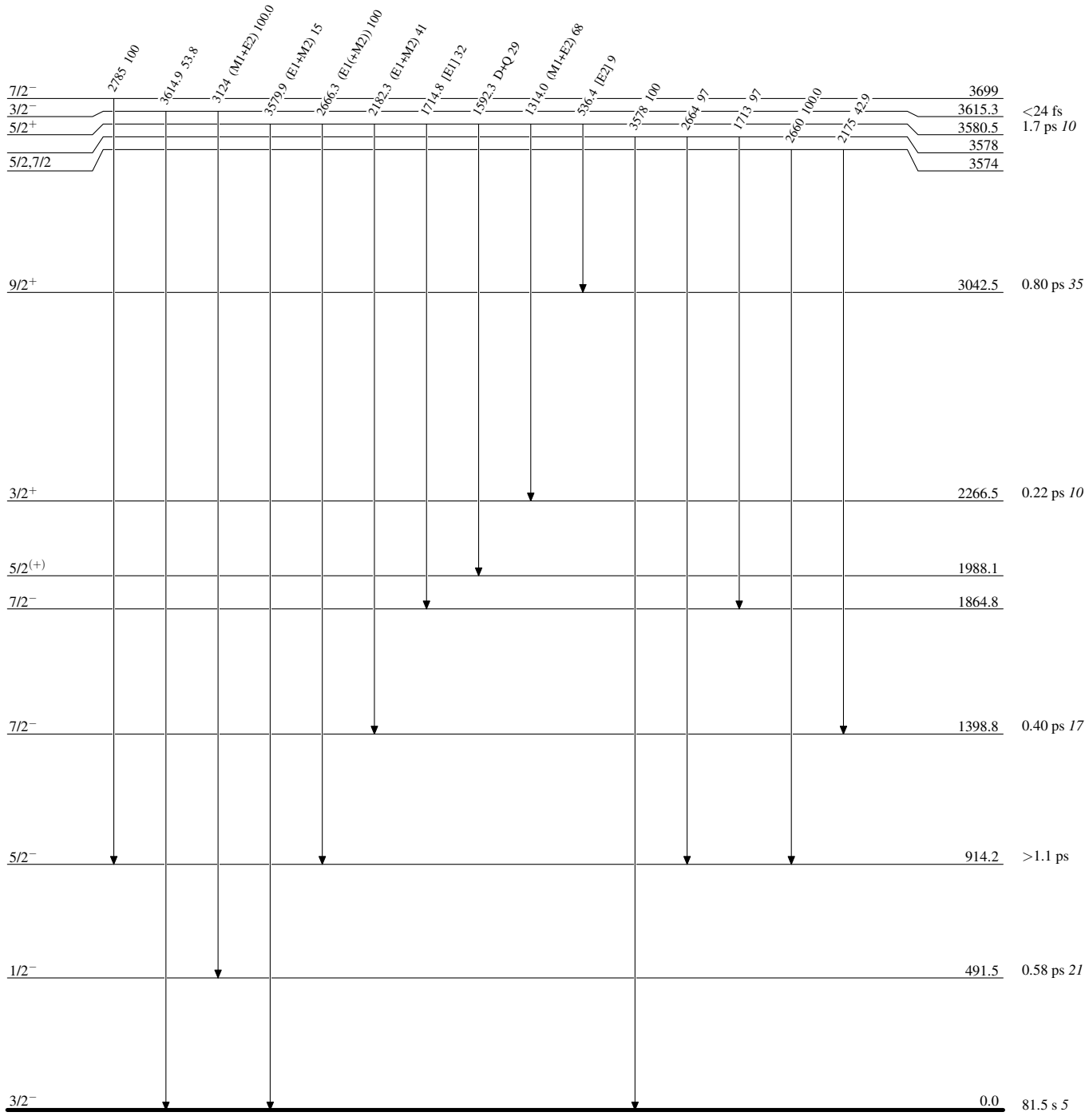


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

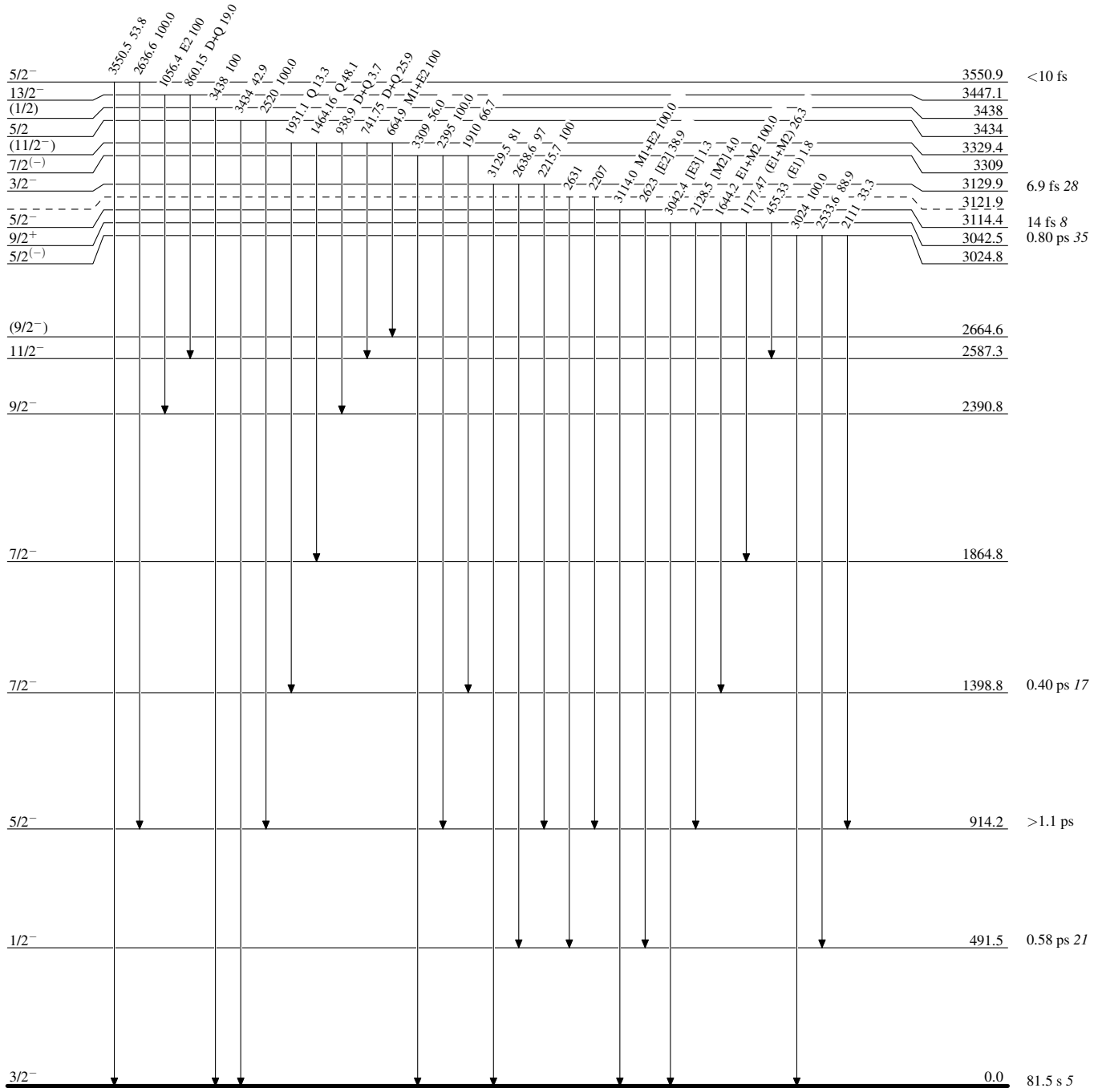


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{29}Cu_{30}$

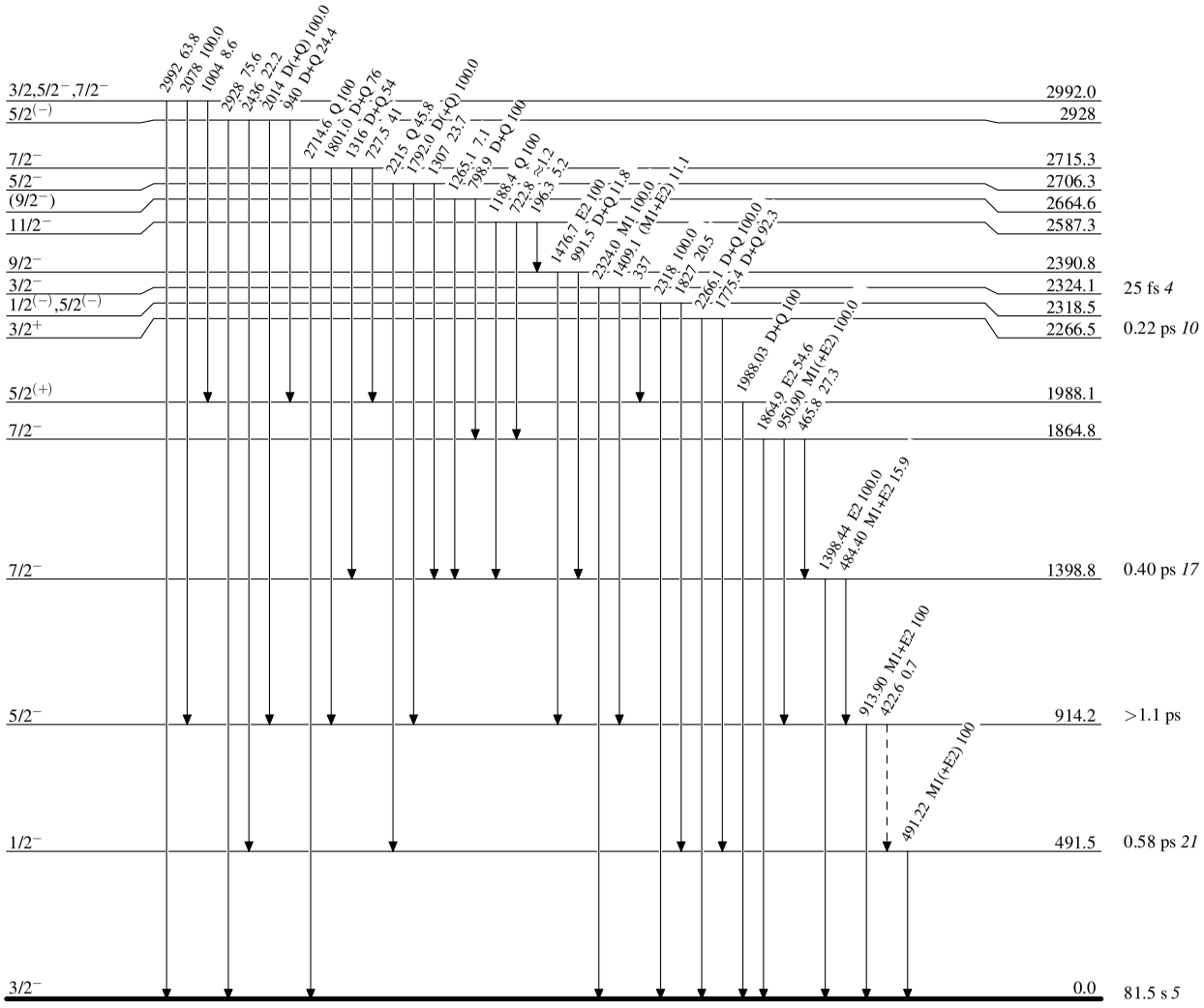
Adopted Levels, Gammas

Legend

Level Scheme (continued)

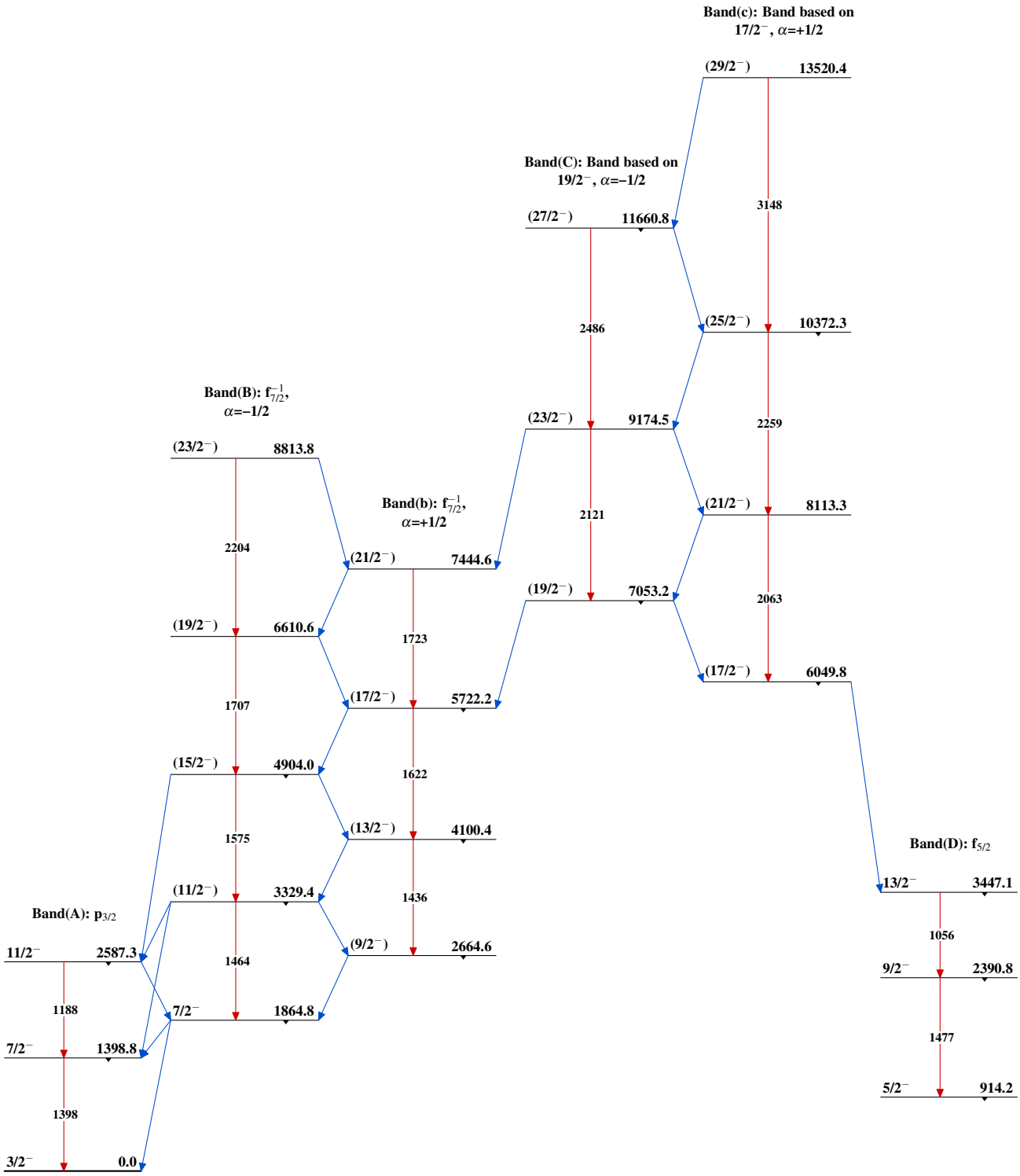
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



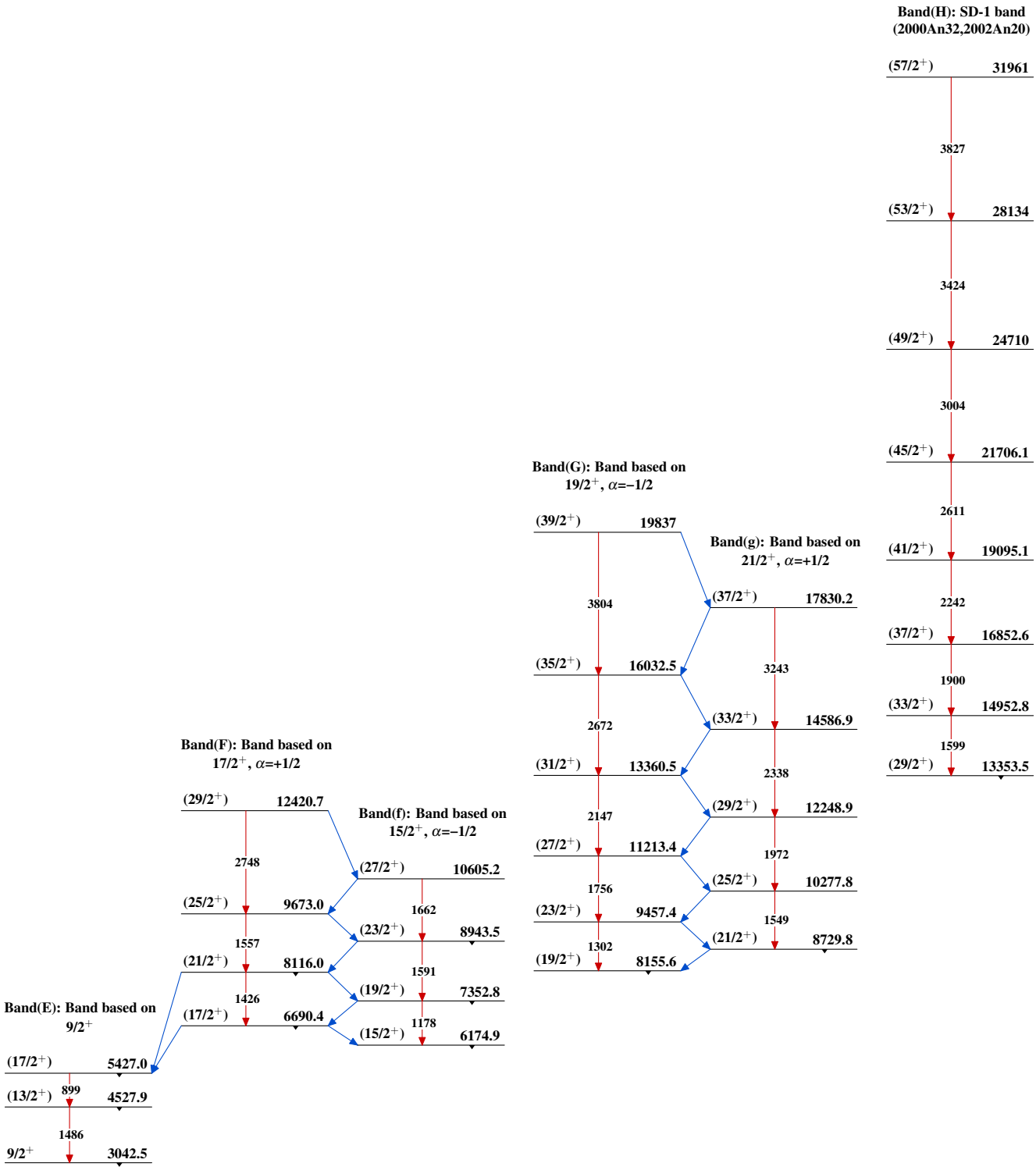
$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas

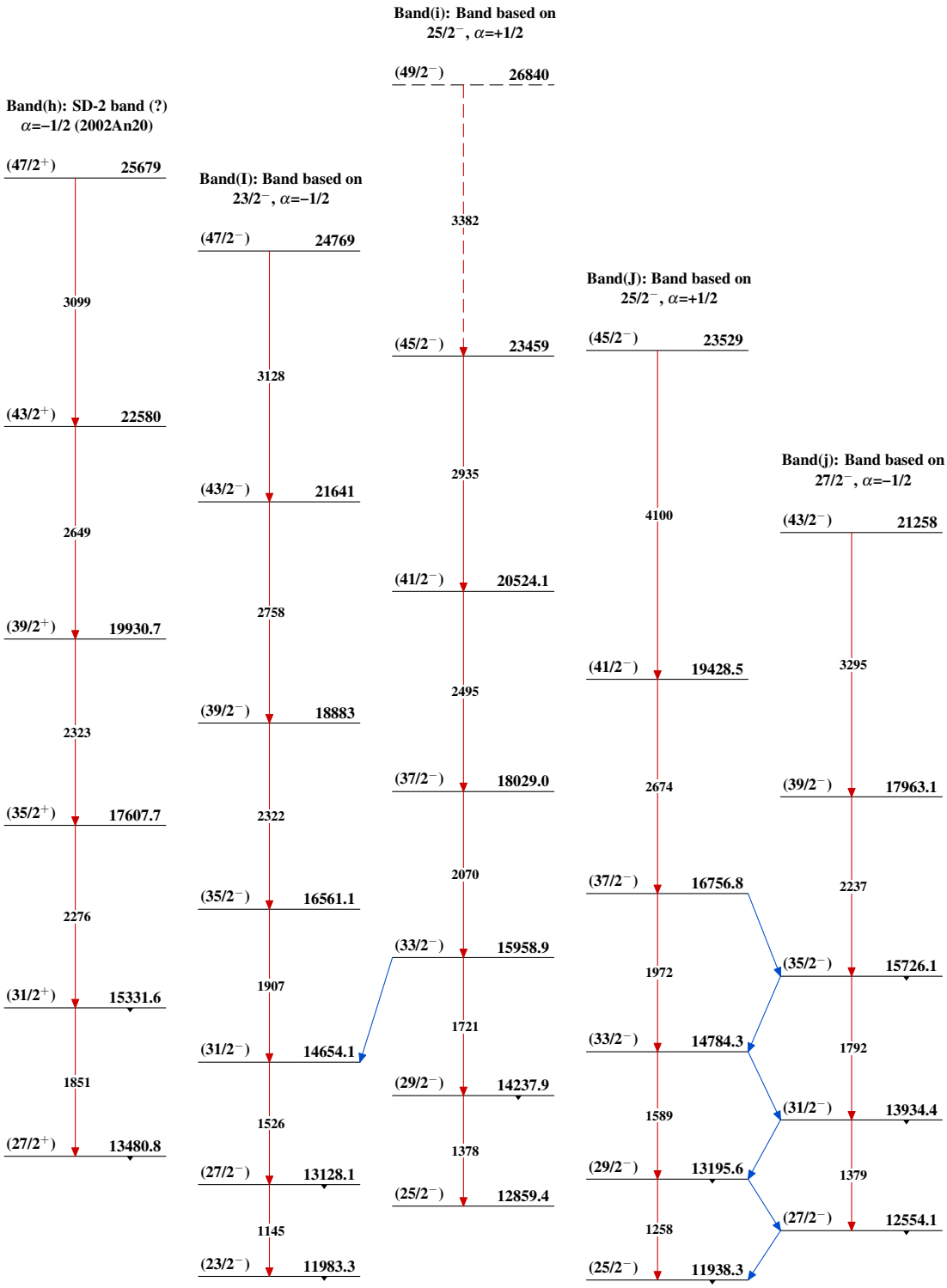


$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas (continued)

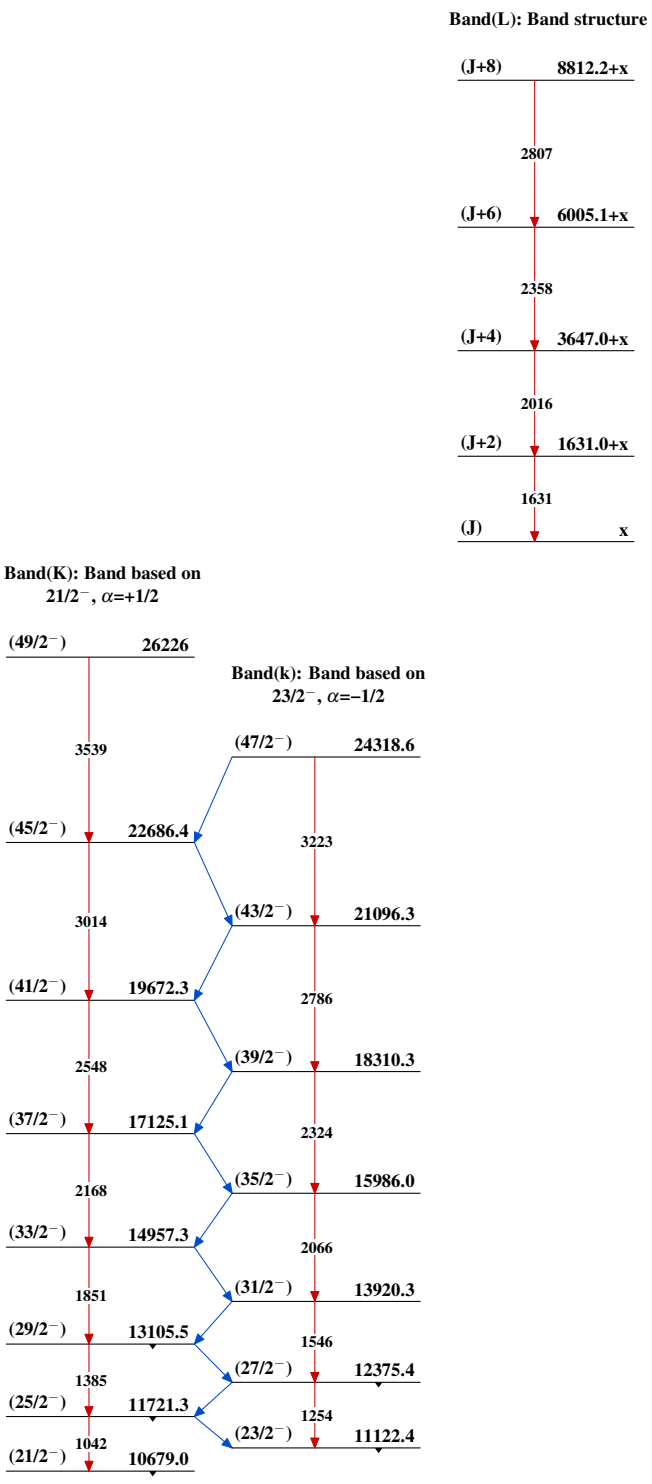


Adopted Levels, Gammas (continued)



$^{59}_{29}Cu_{30}$

Adopted Levels, Gammas (continued)



$^{59}_{29}Cu_{30}$