Adopted Levels, Gammas

History

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

Q(β^-)=−1073.00 *19*; S(n)=10453.9 *11*; S(p)=7363.6 *4*; Q(α)=−6942.2 *3* 2017Wa10

Other Reactions:

^{60}Ni(γ,p):

1975We11: Measured σ(g.s.) and deduce spectroscopic factors.

^{56}Fe(^{7}Li,α):

1996Ba70: E(^{7}Li)=50 MeV; measured continuum α spectrum, θ(lab)=10° to 150°.

^{57}Fe(α,d), E=35 MeV:

1993Yu07: >97% ^{57}Fe target, Si(Au) + Si(Li) ΔE-E telescope, particle identification, Q3D spectrometer (FWHM=29 keV). Searched for stretched, high-spin states. No strongly populated, isolated states were observed up to 10 MeV excitation.

^{60}Ni(e,e′p), (e,e′α):

1988Do12: measured proton spectra from ^{60}Ni excited via (e,e′) to 12-25 MeV (momentum transfer of 0.27 fm^{-1}). Strong population of g.s. and≈3 MeV level(s) observed.

For isotope shift data see, e.g., 1990Ku08.

For additional levels with E>9400, see ^{58}Fe(p,p′).

^{59}Co Levels

Cross Reference (XREF) Flags

A	^{59}Fe β^- decay	J	^{58}Fe(α,t)	S	^{59}Co(α,α')
B	^{59}Ni ε decay	K	^{59}Co(γ,xn)	T	Coulomb excitation
C	^{48}Ca(^{15}N,4nγ)	L	^{59}Co(e,e′)	U	^{60}Ni(n,d)
D	^{56}Fe(α,pγ)	M	^{59}Co(p,p′γ)	V	^{60}Ni(μ^-,νnγ)
E	^{56}Fe(α,p)	N	^{59}Co(p,p′), (pol p,p)	W	^{60}Ni(t,α)
F	^{58}Fe(p,γ)	O	^{59}Co(n,n′)	X	^{60}Ni(d,^{3}He), (pol d,^{3}He)
G	^{58}Fe(p,p′)	P	^{59}Co(n,n′γ)	Y	^{62}Ni(p,α), (pol p,α)
H	^{58}Fe(p,n), (p,nγ) IAR	Q	^{59}Co(d,d′)		
I	^{58}Fe(^{3}He,d)	R	^{59}Co(γ,γ)		

E(level)[†]	J$^\pi$	T$_{1/2}$[e]	XREF	Comments
0.0	7/2$^-$	stable	ABCDEF IJ LMNOPQRSTUVWXY	μ=+4.627 *9*; Q=+0.42 *3* J$^\pi$: 7/2 from electron paramagnetic resonance (1951Bl38) and optical spectroscopy (see 1976Fu06); L=3 in (^{3}He,d), (t,α), (d,^{3}He), (α,t). μ: From NMR (1967Wa16/1951Pr02, 2014StZZ). Q: From 2008Py02, 2016St14, Atomic beam magnetic resonance. Others: +0.41 *1* (1993De41 − reevaluation of hfs parameters), 2014StZZ quote +0.40 *4* (1961Eh01, atomic beam, uncorrected for polarization) and 0.42 *3* (1969Mu11, optical spectroscopy, Sternheimer correction included); 0.35 *3* (1990Gu28, optical spectroscopy, no Sternheimer correction); +0.42 *3* (2008Py02/1960Eh03, 2014StZZ − reevaluation − atomic beam).
1099.256 *3*	3/2$^-$	2.8 ps *6*	AB DEF IJ MNOPQR TuVWXY	J$^\pi$: L=1 in (^{3}He,d), (t,α), (d,^{3}He), (α,t); L(p,p′)=2. Analyzing power analysis in (pol p,α). T$_{1/2}$: weighted average of 3.0 ps *6* (Coulomb excitation) and 2.7 ps *6* (γ,γ). Other: >2.4 ps (p,p′γ), <14 ps (^{59}Fe β^- decay).
1190.46 *16*	9/2$^-$	53.8 fs *25*	A CD F MNOPQRST VW Y	Additional information 1. J$^\pi$: L=2 in (p,p′), (α,α'); 9/2$^-$ from (pol p,α).

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$[e]	XREF	Comments
				T$_{1/2}$: weighted average of 53.7 fs *25* (γ,γ), 55 fs *7* (Coulomb excitation). Others: 33 fs *6* (p,p′γ); 75 fs *17* (n,n′γ); <111 fs (p,γ).
1291.605 *5*	3/2$^-$	551 ps *7*	A D F IJ LMNOPQ TuVWXY	μ=+2.54 *12* J$^{\pi}$: L=1 in (^{3}He,d), (t,α), (d,^{3}He), (α,t); 3/2,5/2 from p-$\gamma(\theta)$ in (α,pγ). T$_{1/2}$: from ^{59}Fe β^- decay. Other: >0.76 ps from (p,p′γ). μ: From integral perturbed angular correlation (IPAC) (1974Ba08, 2014StZZ).
1434.256 *5*	1/2$^-$	210 ps *20*	A D F IJ MNOP V XY	XREF: X(1493). J$^{\pi}$: L=1 in (^{3}He,d); not 3/2 from $\gamma\gamma(\theta)$ in ^{59}Fe β^- decay. T$_{1/2}$: from β^- decay (delayed coin).
1459.51 *14*	11/2$^-$	1.03 ps *13*	CD F MNoPQRST VW Y	J$^{\pi}$: 11/2$^-$ from (pol p,α); 11/2,7/2 from p-$\gamma(\theta)$ in (α,pγ). T$_{1/2}$: weighted average of 1.14 ps *14* (Coulomb excitation), 0.94 ps *13* (γ,γ'). Uncertainty lowest input value. Others: 2 ps *+11−1* (p,p′γ), 0.7 ps *+7−3* (n,n′γ).
1481.72 *12*	5/2$^-$	178 fs *20*	A DeF MNoPQR T V Y	J$^{\pi}$: L=2 in (p,p′); 5/2 from p-$\gamma(\theta)$ in (α,pγ). T$_{1/2}$: weighted average of 190 fs *20* (γ,γ), 139 fs *+35−28* (p,p′γ) and 180 fs *+100−60* in (n,n′γ). Others:≤173 fs in (p,γ),≤14 ps in ^{59}Fe β^- decay.
1744.69 *20*	7/2$^-$	0.32 ps *11*	DeF MNOPQR Tu WXY	Additional information 2. J$^{\pi}$: from (pol p,α); 7/2,9/2 from p-$\gamma(\theta)$ in (α,pγ); L(t,α)=3. T$_{1/2}$: weighted average of 0.28 ps *12* (Coulomb excitation) and 0.36 ps *11* (γ,γ). Others: 0.52 ps *+55−21* (p,p′γ); 0.42 ps *+21−17* (n,n′γ);≤0.17 ps (p,γ).
2061.76 *18*	7/2$^-$	0.15 ps *5*	D F i MNOPQ u WXY	XREF: X(2048). Additional information 3. J$^{\pi}$: L(t,α)=3; 7/2 from p-$\gamma(\theta)$ in (α,pγ). Analyzing power analysis in (pol p,α). T$_{1/2}$: Weighted average of 0.10 ps *+6−4* from ^{59}Co(p,p′γ) and 0.19 ps *+9−5* from ^{59}Co(n,n′γ), DSAM. Other:≤0.097 ps (p,γ).
2087.2 *3*	(5/2$^-$)	17 fs *+8−6*	D F i MNOP Y	Additional information 4. J$^{\pi}$: 5/2,3/2 from p-$\gamma(\theta)$ in (α,pγ); 5/2$^-$ from statistical analysis in (n,n′γ); M1(+E2) γ to 3/2$^-$ and 7/2$^-$. T$_{1/2}$: From (n,n′γ), DSAM. Others: 0.2 ps *+12−1* (p,p′γ),≤173 fs (p,γ).
2153.62 *20*		≥14 fs	CD F MNoP s Y	Additional information 5. J$^{\pi}$: Conflicting spin assignments. 9/2,13/2 in p-$\gamma(\theta)$ in (α,pγ); 9/2$^+$ from Analyzing power analysis in (pol p,α). (13/2) from systematics in (^{15}N,4nγ); statistical analyses yield 15/2 in (p,p′γ), (7/2$^-$) in (n,n′γ); γ from (7/2$^-$) favors 9/2, however, γ from (15/2) yields ΔJ=3. T$_{1/2}$: from (p,p′γ).
2183.5 *4*	(11/2$^-$)[d]	52 fs *16*	CD MNoP s wxY	Additional information 6. J$^{\pi}$: From analyzing power analysis in (pol p,α). D(+Q) γ to 9/2$^-$; (11/2) from reaction systematics and $\gamma(\theta)$ in (^{15}N,4nγ); statistical analysis gives 11/2 in (p,p′γ). Other: 7/2$^-$ in (n,n′γ).

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[e]	XREF	Comments
				$T_{1/2}$: Using the Limitation of Relative Statistical Weight (lwm) method (1985ZiZY) of 33 fs *+8−6* from (p,p′γ) and 66 fs *12* from (n,n′γ) (DSAM) (discrepant data).
2204.78 *19*	5/2$^{(-)}$[d]	≥0.69 ps	D F MNoPQ s wxY	Additional information 7. Jπ: 5/2 from p-γ(θ) in (α,pγ) and from statistical analysis in (n,n′γ); γ to 1/2$^-$ and 9/2$^-$. $T_{1/2}$: from (n,n′γ). Other:≥0.14 ps in (p,p′γ).
2394.8 *4*	(9/2)	0.13 ps *4*	D F MNOP Y	Additional information 8. Jπ: 7/2,9/2 from p-γ(θ) in (α,pγ); 9/2 from Hauser-Feshbach analyses in (p,p′γ) and (n,n′γ). $T_{1/2}$: from (n,n′γ), DSAM. Other: 0.07 ps *+14−6* from (p,p′γ).
2478.7 *4*	(5/2)$^-$	27 fs *3*	D F MN P R Y	Additional information 9. Jπ: statistical analyses give 5/2 in (p,p′γ) and 5/2$^-$ in (n,n′γ); M1+E2 γ to 7/2$^-$. $T_{1/2}$: weighted average of 31 fs *3* from (n,n′γ), 23 fs *3* from (γ,γ) and 26 fs *+13−8* (d,d′γ). Other:≤13 fs, (p,γ).
2540.4 *3*	(5/2$^-$)	0.15 ps *+5−3*	D F MNoP Y	Additional information 10. Jπ: 5/2,7/2,9/2 from p-γ(θ) in (α,pγ); statistical analysis yields 5/2$^{(-)}$ in (n,n′γ), 9/2 in (p,p′γ). γ rays to 7/2$^-$ and 9/2$^-$. γ ray from (1/2$^-$). $T_{1/2}$: from (n,n′γ) − DSAM. Other: 0.2 ps *+18−1* in (p,p′γ).
2581.71[b] *14*	(3/2$^-$,5/2,7/2$^-$)	0.21 ps *+10−6*	F o	Jπ: γ to 7/2$^-$; strong primary γ from (3/2$^-$) in (p,γ). $T_{1/2}$: from (p,γ), DSAM.
2585.8 *5*	7/2$^-$	68 fs *14*	D MNoP W Y	Additional information 11. Jπ: from (pol p,α). Statistical analyses yield 7/2 in (p,p′γ), but 9/2$^-$ in (n,n′γ). L(t,α)=3. $T_{1/2}$: weighted average of 62 fs *+28−14* from (p,p′γ) and 69 fs *14* from (n,n′γ), DSAM.
2713.1 *5*	1/2$^+$		F MN P U W Y	Additional information 12. Jπ: from (pol p,α). L(t,α)=0.
2722.4[#] *9*			MN	Jπ: γ to (11/2) so J≥(7/2).
2770.2 *8*	(3/2$^-$,5/2$^-$)		F MN Y	Additional information 13. Jπ: γ to 7/2$^-$,1/2$^-$.
2781.7 *6*	(5/2$^-$)	97 fs *28*	F MN P R Y	Additional information 14. Jπ: 5/2$^{(-)}$ from statistical analysis in (n,n′γ); γ to 3/2$^-$ and 7/2$^-$. $T_{1/2}$: from (n,n′γ). Other: <58 fs from ^{59}Co(p,p′γ), DSAM.
2816.8[b] *7*	(3/2$^-$,5/2,7/2$^-$)[c]		F P w y	Additional information 15. Jπ: γ to 7/2$^-$; γ from (3/2$^-$).
2823.3[#] *10*	[c]	55 fs *+21−42*	Mn r y	$T_{1/2}$: from (p,p′γ).
2826.2[‡] *3*	(7/2$^-$)	83 fs *28*	n P r	Jπ: 7/2$^-$ from statistical analysis in (n,n′γ). $T_{1/2}$: From (n,n′γ).

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[e]	XREF	Comments
2829.1 *13*	[c]		F Y	E(level): from (p,α); 2828.33 *12* from (p,γ).
2912.0[‡] *7*	(3/2⁻)	43 fs *8*	F n P y	Jπ: 3/2⁻ from statistical analysis in (n,n′γ). $T_{1/2}$: from DSAM in (n,n′γ); possibly low by a factor of≈3.
2914.6[#] *10*			Mn y	
2957.9 *15*	(3/2⁻,5/2,7/2⁻)		F MN P w Y	Additional information 16. Jπ: γ to 3/2⁻ and 7/2⁻.
2963.1[b] *3*			F Mn w	Additional information 17.
2965.9 *6*		33 fs *10*	n P R w Y	Additional information 18. Jπ: (3/2⁻) from statistical analysis in (n,n′γ) conflicts 782.4γ feeding to (11/2) state at 2183.5, see spin-parity comment there. $T_{1/2}$: from (γ,γ); uncertainty in 2966γ branching not included.
2973.0[b] *4*			F w	
2977.0 *13*			w Y	
3014.9 *8*	(7/2⁻)	0.23 ps *+42−10*	F n P y	Additional information 19. $T_{1/2}$: from ^{59}Co(n,n′γ), DSAM. Jπ: from statistical analysis in (n,n′γ).
3016.8[#] *10*			Mn y	
3062.7 *3*	(1/2⁻)		F N P Y	Additional information 20. Jπ: from statistical analysis in (n,n′γ).
3081.62 *16*	(9/2⁻)	0.21 ps *4*	C N P Y	Additional information 21. Jπ: from excitation, γ(θ) in (^{15}N,4nγ); conflicts with 5/2⁻ from statistical analysis in (n,n′γ). (9/2⁻) from (pol p,α) for this and/or 3091 level. $T_{1/2}$: from (n,n′γ), DSAM.
3090.4 *5*	(7/2⁻)	0.21 ps *+17−7*	F N P Y	Additional information 22. $T_{1/2}$: from ^{59}Co(n,n′γ), DSAM. Jπ: from statistical analysis in (n,n′γ). (9/2⁻) for 3081 and/or 3091 level from (pol p,α).
3120.9 *16*			n Pq y	Additional information 23.
3122.06[b] *16*			F n q y	
3140.5 *14*	(7/2,9/2)		n Pq y	Additional information 24. Jπ: from statistical analysis in (n,n′γ). Jπ=(7/2⁻) from (pol p,α) for E=3142.3 *12* level(s).
3141.03[b] *18*	(7/2⁻)		F n q y	Differs from 3140.5 level in (n,n′γ) because γ branching differs. Jπ: γ to 11/2⁻; γ from (3/2⁻). Jπ=(7/2⁻) from (pol p,α) for E=3142.3 *12* level(s).
3160.4 *5*	3/2⁺		n Pq U W Y	Additional information 25. Jπ: from (pol p,α); L(t,α)=2.
3163.7 *3*			F n q	Jπ: γ to 7/2⁻.
3193.8 *10*	(5/2,7/2)		F N P Y	Additional information 26. Jπ: from statistical analysis in (n,n′γ).
3219.5 *17*			F n P Y	Additional information 27. Jπ: 3/2⁻ from statistical analysis in (n,n′γ). 824.7γ to (9/2) in the same dataset yields ΔJ=3.
3223.8 *3*	(13/2)	<0.7 ps	C n	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
3236.4 *11*			n Y	

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[e]	L	XREF	Comments
3240.97[b] 22				F n	
3276.0 9	(3/2−)			N P Y	Additional information 28. Jπ: from statistical analysis in (n,n′γ).
3319.99[b] 18				F	
3323.4 8				n P Y	Additional information 29. Jπ: 7/2(−) from statistical analysis in (n,n′γ), yields ΔJ=3 for 1889.1γ transition.
3325.4 4	(15/2)	<320 fs		C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
3329.8 13				n R Y	Additional information 30.
3350.9 13				Y	
3366.0 12				Y	
3382.0 5	(7/2−)	76 fs 14		N P Y	Additional information 31. Jπ: from statistical analysis in (n,n′γ). $T_{1/2}$: from ^{59}Co(n,n′γ), DSAM.
3414.5 10				N P Y	Additional information 32. Jπ: 9/2− assignment from statistical analysis in (n,n′γ) yields ΔJ=3 for 2315.2γ transition.
3426.1 10	(7/2−)	55 fs +28−21		N P Y	Additional information 33. Jπ: from statistical analysis in (n,n′γ). $T_{1/2}$: from (n,n′γ).
3491.6 11				F N Y	Additional information 34.
3497.4 8	(7/2−)			P Y	Additional information 35. Jπ: from statistical analysis in (n,n′γ).
3565.0 13				F N Y	Additional information 36.
3570.1?[b] 4				F	Jπ: γ from (3/2−).
3580.1[@] 12				N Y	
3599.5[@] 11				N Y	
3622.8 11				F n R Y	Additional information 37.
3626[‡] 1	(5/2)	30 fs +8−6		n P	Jπ: from statistical analysis in (n,n′γ). $T_{1/2}$: from DSAM in (n,n′γ).
3652.8 13				F N Y	Additional information 38.
3667.2 8	(5/2)			N P R Y	Additional information 39. Jπ: from statistical analysis in (n,n′γ).
3737.3 11				N q Y	Additional information 40.
3757.5 12				N q Y	Additional information 41.
3768.9 14				N q Y	Additional information 42.
3792.4 15				N q Y	Additional information 43.
3807.7 13				N s Y	Additional information 44.
3820.9 12				N s Y	Additional information 45.
3832.1 12				N q s Y	Additional information 46.
3842.7 3	(11/2)			C N Y	Jπ: from excitation, γ(θ) in (^{15}N,4nγ).
3854.9 13				N q s Y	Additional information 47.
3888.6 16				q s Y	
3915.2[@] 14				N q Y	
3926.3[@] 17				N Y	
3944.2 3	(7/2+)	0.55 ps +55−2	8	P	Jπ: from statistical analysis in (n,n′γ). $T_{1/2}$: from (n,n′γ), DSAM.
3950.1 12				N R Y	Additional information 48.
3981.7[@] 14				N Y	Additional information 49.
4000.0[@] 25				N Y	
4009.4[b] 4				F	Jπ: γ from (3/2−).
4014.1[@] 13				N Y	

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[e]	XREF	Comments
4026.2[@] *17*			N Y	Additional information 50.
4060.6 *13*			Y	
4086.5[&] *4*	(17/2)	<0.4 ps	C Y	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
4099.6 *15*			Y	
4128.8 *23*			Y	
4151.8 *15*			Y	
4169.7 *14*			Y	
4177.0[&] *3*	(13/2)		C Y	Jπ: from excitation, γ(θ) in (^{15}N,4nγ).
4195.5 *14*			Y	
4235.7 *15*			Y	
4267.2 *16*			Y	
4291.0 *14*			Y	
4307.4[@] *14*			R Y	Additional information 51.
4320.9 *14*			Y	
4347.6 *14*			Y	
4356.9 *20*			Y	
4377.5 *16*			Y	
4390.7 *15*			Y	
4406.8[@] *14*			F Y	Additional information 52.
4412.1[b] *3*			F	
4412.7 *4*	(15/2)		C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ).
4438.5 *14*			Y	
4457.7 *19*			Y	
4466.7[@] *14*			R Y	
4480.0 *14*			Y	
4491.0 *17*			Y	
4506.8[@] *15*			F P Y	
4516.9 *16*			Y	
4552.2 *15*			Y	
4566.3 *15*			Y	
4581.3 *15*			s Y	
4606.3 *15*			s Y	
4616.8 *17*			s Y	
4632.7 *15*			s Y	
4642.9 *17*			s Y	
4688.2 *16*			Y	
4699.5 *18*			Y	
4714.8 *5*	(17/2)	0.8 ps *3*	C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
4715.0 *15*			Y	
4730.6 *17*			Y	
4743.2 *19*			Y	
4760.2 *16*			Y	
4767.9 *15*			Y	
4798.5 *5*	(19/2)	<0.14 ps	C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
4806.4 *15*			Y	
4818.0 *17*			Y	
4836.3 *17*			Y	
4855.7 *15*			Y	
4877.0 *15*			Y	
4890.5 *16*			Y	
4906.2 *15*			Y	

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Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[e]	XREF	Comments
4909.0 *5*		0.08 ps *4*	C	$T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
4917.2 *17*			Y	
4927.9 *18*			Y	
4959.2 *16*			Y	
4969.1 *17*			Y	
4983.1 *17*			Y	
4990.9 *17*			Y	
5001.8 *26*			Y	
5120 *40*	3/2$^+$,5/2$^+$		W	Jπ: L(t,α)=2.
5256.0 *9*	(21/2)		C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ).
5368.0 *5*	(19/2)	0.07 ps *4*	C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
5390 *50*			E	
6362.2 *6*	(21/2)	<0.14 ps	C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
6570 *80*			E	
6878.7 *8*		<0.10 ps	C	$T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
7457.2 *11*	(23/2)	<0.10 ps	C	Jπ: from excitation, γ(θ) in (^{15}N,4nγ). $T_{1/2}$: from ^{48}Ca(^{15}N,4nγ), DSAM.
7620 *60*			E	
8430?			E	
9541.14[a] *18*	(3/2$^-$)	≈15.5 eV	FG	Jπ: from ^{58}Fe(p,p′). Fragment of 3/2$^-$ ^{59}Fe(g.s.) analogue. Γ from (p,γ).
9549.70[a] *15*	(3/2$^-$)	≈102 eV	FG	Jπ: probable analogue fragment of 3/2$^-$ ^{59}Fe(g.s.). Γ from (p,γ).
9553.13[a] *12*	(3/2$^-$)	≈57 eV	FG	Jπ: probable analogue fragment of 3/2$^-$ ^{59}Fe(g.s.). Γ from (p,γ).
9835 *5*	(1/2$^-$)		G	E(level): approximate centroid of ^{59}Fe(287 level) analogue fragments. See ^{58}Fe(p,p′) for E and $Γ_{p0}$ of 10 fragments, E=9751 *3* to 9890 *3*. Jπ: from ^{58}Fe(p,p′).
≈10293	(3/2$^-$)		G	Jπ: if analogue of 3/2$^-$ ^{59}Fe(726 level).
11148	(5/2$^-$)		F H	E(level): from (p,n), (p,nγ) IAR. Jπ: analogue of 5/2$^-$ ^{59}Fe(1570 level).
16.3×10^3 *5*	$^-$	5.6 MeV *4*	S	GQR.
16370	$^+$	2.56 MeV	K	GDR component.
18900	$^+$	7.61 MeV	K	GDR component.

[†] From least-squares adjustment for levels with measured Eγ. Otherwise weighted average of E(level) values from all reactions except (p,γ), unless noted otherwise. See also (d,^{3}He) for unresolved clusters of states with E>3200.
[‡] From (n,n′γ).
[#] From (p,p′γ).
[@] From (p,α), (pol p,α).
[&] From (^{15}N,4nγ).
[a] Approximate centroid of ^{59}Fe(g.s.) analogue fragments is 9545 *5*. See ^{58}Fe(p,p′) for E and $Γ_{p0}$ of 14 fragments, E=9465 *3* to 9618 *3*.
[b] From least squares adjustment of Eγ in (p,γ); note, however, that this value is probably low since Eγ values from (p,γ) appear to be consistently low.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{59}Co Levels (continued)

[c] L(t,α)=1, $J^{\pi}=3/2^{-}$ from (pol d,^{3}He) for one or more of the 2817, 2824 and 2829 levels.
[d] $J^{\pi}=7/2^{-}$ from (pol d,^{3}He) and L(d,^{3}He)=3 for E≈2209−keV level; this conflicts with adopted J^{π} for 2205 levels.
[e] For a weighted average value, uncertainty is the lowest input value.

Adopted Levels, Gammas (continued)

γ(^{59}Co)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[bd]	α[c]	Comments
1099.256	3/2$^-$	1099.245[#] *3*	100	0.0	7/2$^-$	E2		1.74×10^{-4}	α(K)=0.0001569 *22*; α(L)=1.515×10^{-5} *22*; α(M)=2.11×10^{-6} *3* α(N)=9.41×10^{-8} *14* B(E2)(W.u.)=9.2 *20* E_γ: from β^- decay; 1098.50 *5* in (p,γ), 1099.4 *2* in (α,pγ). Mult.: from α(exp) in ^{59}Fe β^- decay.
1190.46	9/2$^-$	1189.70 *5*	100	0.0	7/2$^-$	M1+E2	+0.21 *5*	1.32×10^{-4}	α(K)=0.0001140 *17*; α(L)=1.096×10^{-5} *16*; α(M)=1.528×10^{-6} *22* α(N)=6.86×10^{-8} *10*; α(IPF)=5.31×10^{-6} *9* B(M1)(W.u.)=0.234 *12*; B(E2)(W.u.)=12 *4* Mult.: D+Q from (α,pγ); not E1+M2 from RUL. δ: From (α,pγ). Others: 0.16 *9* from (γ,γ), 0.0 *6* from Coulomb excitation.
1291.605	3/2$^-$	192.343[#] *5*	7.09 *24*	1099.256	3/2$^-$	M1+E2	+0.22 *3*	0.0091 *5*	α(K)=0.0082 *5*; α(L)=0.00082 *5*; α(M)=0.000114 *6* α(N)=4.92×10^{-6} *25* B(M1)(W.u.)=0.000354 *15*; B(E2)(W.u.)=0.87 *23* E_γ: from β^- decay. Mult.: From D+Q from γγ(θ) and α(exp) in ^{59}Fe β^- decay. δ: From ^{59}Fe β^- decay.
		1291.590[#] *6*	100.0 *14*	0.0	7/2$^-$	E2		1.48×10^{-4}	B(E2)(W.u.)=0.0195 *5* α(K)=0.0001095 *16*; α(L)=1.055×10^{-5} *15*; α(M)=1.470×10^{-6} *21* α(N)=6.57×10^{-8} *10*; α(IPF)=2.66×10^{-5} *4* E_γ: Other: 1290.74 *6* in (p,γ). Mult.: from α(exp) in ^{59}Fe β^- decay.
1434.256	1/2$^-$	142.651[#] *2*	100[#] *4*	1291.605	3/2$^-$	M1+E2	−0.028 *+9−14*	0.0161 *3*	α(K)=0.01442 *23*; α(L)=0.001436 *23*; α(M)=0.000200 *4* α(N)=8.76×10^{-6} *14* B(M1)(W.u.)=0.028 *3*; B(E2)(W.u.)=2.0 *14* Mult.,δ: from γγ(θ) in ^{59}Fe β^- decay; RUL disallows large solutions (+1.7 to +2.1). Other: −0.06 *3* (^{59}Fe β^- decay).
		334.8[#] *2*	26.4[#] *10*	1099.256	3/2$^-$	(M1+E2)	+1.8 *+4−6*	0.0049 *7*	α(K)=0.0044 *6*; α(L)=0.00043 *6*; α(M)=6.0×10^{-5} *9* α(N)=2.6×10^{-6} *4* B(M1)(W.u.)=0.00014 *5*; B(E2)(W.u.)=7.4 *12* E_γ: Other: 334.56 *7* in (p,γ). Mult.: D(+Q) from γγ(θ) in ^{59}Fe β^- decay; Adopted Δπ=no. δ: or −0.05 *+3−7* from ^{59}Fe β^- decay.

$^{59}_{27}Co_{32}$-9

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[bd]	α[c]	Comments
1459.51	11/2$^-$	269.01[@] *11*	7.6 *16*	1190.46	9/2$^-$				
		1459.61 *16*	100.0 *8*	0.0	7/2$^-$	E2		1.67×10^{-4}	α(K)=8.47×10^{-5} *12*; α(L)=8.14×10^{-6} *12*; α(M)=1.135×10^{-6} *16* α(N)=5.08×10^{-8} *8*; α(IPF)=7.27×10^{-5} *11* B(E2)(W.u.)=5.6 *8* Eγ: weighted average from (^{15}N,4nγ) and (α,pγ). Other Eγ: 1459.00 *21* in (p,γ). Mult.: pure Q from (α,pγ); not M2 from RUL.
1481.72	5/2$^-$	189[#e]	1.9[#] *19*	1291.605	3/2$^-$				
		382.48 *24*	29.4 *23*	1099.256	3/2$^-$	(M1+E2)	<0.21	0.00146 *6*	α(K)=0.00132 *5*; α(L)=0.000128 *5*; α(M)=1.79×10^{-5} *7* α(N)=7.9×10^{-7} *3* B(M1)(W.u.)>0.41 Eγ: Weighted average from β^- decay and (α,pγ). Other Eγ: 382.25 *7* in (p,γ). Mult.: D+Q from (α,pγ); adopted $\Delta\pi$=no. δ: from RUL; however, δ(D,Q)=−4 *2* from (α,pγ).
		1481.70 *14*	100.0 *21*	0.0	7/2$^-$	(M1+E2)	−0.19 *4*	1.45×10^{-4}	α(K)=7.50×10^{-5} *11*; α(L)=7.20×10^{-6} *11*; α(M)=1.003×10^{-6} *15* α(N)=4.51×10^{-8} *7*; α(IPF)=6.14×10^{-5} *10* B(M1)(W.u.)=0.028 *4*; B(E2)(W.u.)=0.9 *4* Eγ: weighted average from β^- decay and (α,pγ). Other Eγ: 1481.03 *5* in (p,γ). Mult.: D+Q from (α,pγ); adopted $\Delta\pi$=no. δ: from B(E2) in Coulomb excitation and adopted $T_{1/2}$ and branching; sign from (γ,γ). Others: >−0.4 and <+0.1 from (γ,γ); −5 +2−5 from (α,pγ).
1744.69	7/2$^-$	263.0[‡]	20 *3*	1481.72	5/2$^-$	(M1)		0.00344	α(K)=0.00309 *5*; α(L)=0.000304 *5*; α(M)=4.24×10^{-5} *6* α(N)=1.87×10^{-6} *3* B(M1)(W.u.)=0.42 *13* Mult.: D(+Q) from (α,pγ) with larger uncertainty in δ=+0.02 *13*. Adopted $\Delta\pi$=no.
		554.2 *2*	58 *5*	1190.46	9/2$^-$	(M1)		6.12×10^{-4}	α(K)=0.000551 *8*; α(L)=5.34×10^{-5} *8*; α(M)=7.44×10^{-6} *11* α(N)=3.33×10^{-7} *5* B(M1)(W.u.)=0.13 *4* Eγ: from (α,pγ). Other Eγ: 553.88 *5* in (p,γ). Mult.: D(+Q) from (α,pγ) with larger uncertainty in δ=+0.01 *4*; adopted $\Delta\pi$=no.

$^{59}_{27}Co_{32}$-10

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [&]	E_f	J_f^π	Mult. [b]	δ [bd]	α [c]	Comments
1744.69	7/2⁻	1744.7 *3*	100 *3*	0.0	7/2⁻	M1+E2	−0.87 *+15−22*	2.32×10^{-4} *6*	B(M1)(W.u.)=0.0041 *14*; B(E2)(W.u.)=1.9 *5* α(K)=5.72×10^{-5} *10*; α(L)=5.48×10^{-6} *9*; α(M)=7.65×10^{-7} *13* α(N)=3.44×10^{-8} *6*; α(IPF)=0.000168 *6* E_γ: from (α,pγ). Other Eγ: 1743.85 *7* in (p,γ). Mult.: D+Q from (α,pγ); not E1+M2 from RUL. δ: From (α,pγ).
2061.76	7/2⁻	317.1[‡]	8 *5*	1744.69	7/2⁻				I_γ: From (p,p′γ) and normalized to Iγ(871γ)=100.
		579.68 *6*	92 *7*	1481.72	5/2⁻	(E2+M1)	0.21 *21*	0.00057 *5*	α(K)=0.00051 *4*; α(L)=5.0×10^{-5} *4*; α(M)=6.9×10^{-6} *6* α(N)=3.10×10^{-7} *23* B(M1)(W.u.)=0.31 *11* Mult.: D+Q from (α,pγ); adopted Δπ=no. δ: ≤0.42 from RUL; however, δ(D,Q)=−5 *3* from (α,pγ).
		871.3[‡]	100 *8*	1190.46	9/2⁻	(M1+E2)	+0.12 *9*	2.35×10^{-4}	α(K)=0.000212 *4*; α(L)=2.04×10^{-5} *4*; α(M)=2.84×10^{-6} *5* α(N)=1.275×10^{-7} *21* B(M1)(W.u.)=0.10 *4*; B(E2)(W.u.)=4 *+7−3* Mult.: D+Q from (α,pγ); adopted Δπ=no.
		2061.7 *5*	16 *4*	0.0	7/2⁻				
2087.2	(5/2⁻)	342.5[‡]	35 *11*	1744.69	7/2⁻				
		795.6	84 *10*	1291.605	3/2⁻	M1		2.82×10^{-4}	α(K)=0.000254 *4*; α(L)=2.45×10^{-5} *4*; α(M)=3.42×10^{-6} *6* α(N)=1.532×10^{-7} *22* B(M1)(W.u.)=0.47 *+19−24* Other Eγ: 795.43 *6* in (p,γ). Mult.: D(+Q) from (α,pγ) with larger uncertainty in δ=+0.04 *9*, Adopted Δπ=(no). δ: from (α,pγ).
		2086.65 *10*	100 *11*	0.0	7/2⁻	M1		3.37×10^{-4}	B(M1)(W.u.)=0.031 *+12−16* α(K)=4.05×10^{-5} *6*; α(L)=3.88×10^{-6} *6*; α(M)=5.41×10^{-7} *8* α(N)=2.44×10^{-8} *4*; α(IPF)=0.000292 *4* δ: from (α,pγ), if J(2087 level)=5/2. Mult.: D(+Q) from (α,pγ) with larger uncertainty in δ=−0.07 *14*; adopted Δπ=(no).
2153.62		694.02 *14*	100	1459.51	11/2⁻	D(+Q)			E_γ: weighted average from (^{15}N,4nγ) and (α,pγ). δ: −0.05 *8* if J(2153 level)=9/2, +0.11 *6* if J=13/2.
2183.5	(11/2⁻)	439		1744.69	7/2⁻				E_γ: Reported in (α,pγ) only.
		992.88[@] *12*	100 *4*	1190.46	9/2⁻	D+Q	+0.09 *6*		Mult.: D+Q from (α,pγ); sign from RUL.

$^{59}_{27}Co_{32}$-11

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[bd]	α[c]	Comments
2183.5	(11/2$^-$)	2183.5[‡]	13 *4*	0.0	7/2$^-$				
2204.78	5/2$^{(-)}$	722.77 *7*	100 *9*	1481.72	5/2$^-$				E_γ: 722.77 *7* in (p,γ).
		770.5[‡]	26 *6*	1434.256	1/2$^-$				
		913.05 *20*	72 *9*	1291.605	3/2$^-$	D+Q	+0.25 *10*		
		1014.3[‡]	61 *13*	1190.46	9/2$^-$				
		2203.51 *22*	19 *11*	0.0	7/2$^-$				I_γ: from (n,n′γ); 58 *13* from (p,p′γ).
2394.8	(9/2)	333.0[‡]	12[a] *4*	2061.76	7/2$^-$				
		650.1[‡]	100 *7*	1744.69	7/2$^-$	D+Q	+0.25 *8*		I_γ: From (n,n′γ).
		935.3[‡]	40 *5*	1459.51	11/2$^-$	D(+Q)	−0.12 *11*		
		2394.8[‡]	76 *7*	0.0	7/2$^-$				I_γ: From (n,n′γ); 42 *10* from (p,p′γ).
2478.7	(5/2)$^-$	273.9[‡]	15[a] *11*	2204.78	5/2$^{(-)}$				
		2478.10 *11*	100[a] *11*	0.0	7/2$^-$	M1+E2	−0.28 *20*	5.02×10^{-4} *12*	α(K)=3.04×10^{-5} *5*; α(L)=2.90×10^{-6} *5*; α(M)=4.05×10^{-7} *6* α(N)=1.82×10^{-8} *3*; α(IPF)=0.000468 *12* B(M1)(W.u.)=0.043 *10*; B(E2)(W.u.)=1.0 *+14−9* Mult.: D+Q from (α,pγ); not E1+M2 from RUL.
2540.4	(5/2$^-$)	795.7[‡]	100[a] *13*	1744.69	7/2$^-$	D+Q			δ: −2 *+2−30* if J(2540 level)=5/2, −0.34 *15* if J=7/2, +0.22 *8* if J=9/2.
		1350.0 *3*	19[a] *6*	1190.46	9/2$^-$				E_γ: from (n,n′γ). Other Iγ: 8.8 *24* in (n,n′γ).
		2540.4[‡]	19[a] *4*	0.0	7/2$^-$				Other Iγ: 72 *5* in (n,n′γ).
2581.71	(3/2$^-$,5/2,7/2$^-$)	2581.62 *12*	100	0.0	7/2$^-$				
2585.8	7/2$^-$	1395.4[‡]	73 *10*	1190.46	9/2$^-$				I_γ: from (α,pγ) and (n,n′γ); doublet in (p,p′γ) and some (n,n′γ) studies.
		2585.8[‡]	100 *14*	0.0	7/2$^-$				
2713.1	1/2$^+$	1613.8[‡]	100[a]	1099.256	3/2$^-$				E_γ: 1613.03 *7* in (p,γ).
2722.4		182.0[‡]	<25[a]	2540.4	(5/2$^-$)				
		538.9[‡]	100[a]	2183.5	(11/2$^-$)				
2770.2	(3/2$^-$,5/2$^-$)	708.4[‡]		2061.76	7/2$^-$				
		1335.70 *7*		1434.256	1/2$^-$				From (p,γ) only.
2781.7	(5/2$^-$)	1682.4[‡e]	18	1099.256	3/2$^-$				
		2781.96 *25*	100	0.0	7/2$^-$				
2816.8	(3/2$^-$,5/2,7/2$^-$)	2816.7 *9*	100	0.0	7/2$^-$				E_γ: Other: 2816 in (n,n′γ).
2823.3		670.6[‡]	36[a] *14*	2153.62					
		737.0[‡]	43[a] *14*	2087.2	(5/2$^-$)				
		2824.2[‡]	100[a] *36*	0.0	7/2$^-$				
2826.2	(7/2$^-$)	1634	10 *3*	1190.46	9/2$^-$				E_γ: from (n,n′γ).
		1726.9[‡]	100 *24*	1099.256	3/2$^-$				

$^{59}_{27}Co_{32}$-12

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Comments
2826.2	(7/2$^-$)	2826.2[‡]	51 *24*	0.0	7/2$^-$	
2829.1		1729.56 *7*	100	1099.256	3/2$^-$	
2912.0	(3/2$^-$)	852.2[‡]	41	2061.76	7/2$^-$	
		2912.0[‡]	100	0.0	7/2$^-$	
2914.6		519.8[‡]	60[a] *6*	2394.8	(9/2)	
		827.4[‡]	53[a] *11*	2087.2	(5/2$^-$)	
		1724.2[‡]	100[a] *15*	1190.46	9/2$^-$	
2957.9	(3/2$^-$,5/2,7/2$^-$)	372.1[‡e]	66	2585.8	7/2$^-$	
		753.1[‡]	35	2204.78	5/2$^{(-)}$	
		1858.6[‡]	100	1099.256	3/2$^-$	E_γ: 1860.1 in (p,p′γ), 1856.47 *11* in (p,γ).
2963.1		1219.3 *4*		1744.69	7/2$^-$	
		1774.1 *6*		1190.46	9/2$^-$	
		2963.5 *5*		0.0	7/2$^-$	
2965.9		782.4[‡]	39	2183.5	(11/2$^-$)	
		1866.6[‡]	14	1099.256	3/2$^-$	
		2965.9[‡]	100	0.0	7/2$^-$	
2973.0		1230.8 *9*	100	1744.69	7/2$^-$	
3014.9	(7/2$^-$)	953.1[‡]	54	2061.76	7/2$^-$	
		1555.4[‡]	100	1459.51	11/2$^-$	
		1723.3[‡]	67	1291.605	3/2$^-$	
		3014.9[‡]	86	0.0	7/2$^-$	
3016.8		622.0[‡]	41[a] *14*	2394.8	(9/2)	
		1272.1[‡]	100[a] *31*	1744.69	7/2$^-$	
		1557.3[‡]	63[a] *24*	1459.51	11/2$^-$	
3062.7	(1/2$^-$)	522.3[‡]	100	2540.4	(5/2$^-$)	
3081.62	(9/2$^-$)	1890.8[@] *5*	100[@]	1190.46	9/2$^-$	
3090.4	(7/2$^-$)	1003.2[‡]	100	2087.2	(5/2$^-$)	
		1798.8[‡]	54	1291.605	3/2$^-$	
		1991.1[‡]	54	1099.256	3/2$^-$	
3120.9		3120.9[‡]	100	0.0	7/2$^-$	
3122.06		2023.31 *11*	100	1099.256	3/2$^-$	
3140.5	(7/2,9/2)	1053.3[‡]	60	2087.2	(5/2$^-$)	
		1950.0[‡]	45	1190.46	9/2$^-$	
		3140.5[‡]	100	0.0	7/2$^-$	
3141.03	(7/2$^-$)	1397.45 *14*		1744.69	7/2$^-$	
		1681.73 *24*		1459.51	11/2$^-$	

$^{59}_{27}Co_{32}$-13

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ †	I_γ &	E_f	J_f^π	Comments
3160.4	3/2+	3160.4‡	100	0.0	7/2−	
3163.7		2064.4 *3*	100	1099.256	3/2−	
3193.8	(5/2,7/2)	1040.2‡	60	2153.62		
		1902.2‡	22	1291.605	3/2−	
		2003.4‡	19	1190.46	9/2−	
		3193.8‡	100	0.0	7/2−	
3219.5		395.3‡*e*	89	2826.2	(7/2−)	
		824.7‡	100	2394.8	(9/2)	
		3219.5‡*e*	182	0.0	7/2−	
3223.8	(13/2)	1040.84@ *18*	100@ *5*	2183.5	(11/2−)	
		1764.22@ *23*	82@ *5*	1459.51	11/2−	
3240.97		2142.34 *17*	100	1099.256	3/2−	
3276.0	(3/2−)	3276.0‡	100	0.0	7/2−	
3319.99		1839.05 *15*		1481.72	5/2−	
		2220.7 *4*		1099.256	3/2−	
3323.4		541.7‡	19	2781.7	(5/2−)	
		1169.8‡	38	2153.62		
		1841.7‡*e*	15	1481.72	5/2−	
		1889.1‡*e*	85	1434.256	1/2−	
		2031.8‡	51	1291.605	3/2−	
		3323.4‡	100	0.0	7/2−	
3325.4	(15/2)	1172.13@ *20*	100@	2153.62		
3329.8		3328 *2*	100	0.0	7/2−	E_γ: from (γ,γ).
3382.0	(7/2−)	1637.3‡	33	1744.69	7/2−	
		1922.5‡	100	1459.51	11/2−	
		3382.0‡	>12	0.0	7/2−	
3414.5		1932.8‡	100	1481.72	5/2−	
		2315.2‡	79	1099.256	3/2−	
		3414.5‡	34	0.0	7/2−	
3426.1	(7/2−)	1966.6‡	100	1459.51	11/2−	
		3426.1‡	61	0.0	7/2−	
3491.6		2006.6 *2*		1481.72	5/2−	
		2198.4 *12*		1291.605	3/2−	
		2388.7 *4*		1099.256	3/2−	
3497.4	(7/2−)	3497.4‡	100	0.0	7/2−	
3565.0		1475.95 *21*		2087.2	(5/2−)	
		2083.0 *4*		1481.72	5/2−	

$^{59}_{27}Co_{32}$-14

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ †	I_γ &	E_f	J_f^π	Comments
3565.0		2269.6 *4*		1291.605	3/2$^-$	
3622.8		3621.7 *6*	100	0.0	7/2$^-$	Other Eγ: 3625 *2* in (γ,γ).
3626	(5/2)	2144.3‡	100	1481.72	5/2$^-$	
3652.8		2550.7 *3*	100	1099.256	3/2$^-$	
3667.2	(5/2)	2567.9‡	100	1099.256	3/2$^-$	
		3667.4‡	75	0.0	7/2$^-$	
3842.7	(11/2)	2383.3@ *3*	89@ *11*	1459.51	11/2$^-$	
		2651.6@ *5*	100@ *9*	1190.46	9/2$^-$	
3944.2	(7/2$^+$)	2652.6‡	100	1291.605	3/2$^-$	
3950.1		3954 *3*	100	0.0	7/2$^-$	Eγ: from (γ,γ).
4009.4		2576.5 *5*		1434.256	1/2$^-$	
4086.5	(17/2)	760.81@ *13*	100@	3325.4	(15/2)	
4177.0	(13/2)	333.9@ *3*	100@ *23*	3842.7	(11/2)	
		1095.57@ *18*	28@ *7*	3081.62	(9/2$^-$)	
		1993.60@ *23*	81@ *12*	2183.5	(11/2$^-$)	
		2023.1@	9@ *5*	2153.62		Eγ: from level energy difference in (^{15}N,4nγ).
		2716.4@ *5*	14@ *5*	1459.51	11/2$^-$	
4307.4		4303 *3*	100	0.0	7/2$^-$	Eγ: from (γ,γ).
4406.8		2345.0 *5*		2061.76	7/2$^-$	
		4408.6 *5*		0.0	7/2$^-$	
4412.1		1456.9 *4*		2957.9	(3/2$^-$,5/2,7/2$^-$)	
		2930.4 *5*		1481.72	5/2$^-$	
		2980 *1*		1434.256	1/2$^-$	
4412.7	(15/2)	235.72@ *11*	100@ *7*	4177.0	(13/2)	
		1188.6@	15@ *4*	3223.8	(13/2)	Eγ: from level-energy difference in (^{15}N,4nγ).
		2259.28@ *25*	32@ *6*	2153.62		
4466.7		4467 *3*	100	0.0	7/2$^-$	Eγ: from (γ,γ).
4506.8		1345.7 *3*		3160.4	3/2$^+$	
		1796.49 *17*		2713.1	1/2$^+$	
		2306.4 *6*		2204.78	5/2$^{(-)}$	Eγ: other Eγ: 2307.8 *3* in (n,n′γ).
4714.8	(17/2)	302.4@ *3*	100@	4412.7	(15/2)	
4798.5	(19/2)	712.2@ *3*	100@	4086.5	(17/2)	
4909.0		1583.3@ *3*	100@	3325.4	(15/2)	
5256.0	(21/2)	457.5@ *7*	100@	4798.5	(19/2)	
5368.0	(19/2)	653.00@ *10*	100@	4714.8	(17/2)	
6362.2	(21/2)	994.1@ *3*	100@	5368.0	(19/2)	
6878.7		2080.0@ *6*	100@	4798.5	(19/2)	
7457.2	(23/2)	1095.1@ *9*	100@	6362.2	(21/2)	

$^{59}_{27}Co_{32}$-15

Adopted Levels, Gammas (continued)

γ(^{59}Co) (continued)

E_i(level)	J_i^π	E_γ †	I_γ &	E_f	J_f^π
9541.14	(3/2$^-$)	5034.5 *4*	17	4506.8	
		5128.5 *7*	6	4412.1	
		5134.5 *5*	11	4406.8	
		5532.0 *6*	11	4009.4	
		5892.0 *6*	6	3652.8	
		5920.2 *9*	11	3622.8	
		6055.4 *5*	22	3491.6	
		6221.7 *5*	11	3319.99	
		6300.6 *7*	11	3240.97	
		6346.8 *8*	6	3193.8	(5/2,7/2)
		6420.0 *7*	6	3122.06	
		6585 *2*	17	2957.9	(3/2$^-$,5/2,7/2$^-$)
		6712.2 *4*	28	2829.1	
		6770.2 *5*	17	2770.2	(3/2$^-$,5/2$^-$)
		6958.8 *4*	67	2581.71	(3/2$^-$,5/2,7/2$^-$)
		7454.1 *6*	17	2087.2	(5/2$^-$)
		7479.5 *6*	22	2061.76	7/2$^-$
		8058.9 *5*	44	1481.72	5/2$^-$
		8106.7 *7*	17	1434.256	1/2$^-$
		8249.2 *5*	39	1291.605	3/2$^-$
		8441.6 *4*	61	1099.256	3/2$^-$
		9540.3 *4*	100	0.0	7/2$^-$
9549.70	(3/2$^-$)	5038 *1*	6	4506.8	
		5137.5 *9*	11	4412.1	
		5142.3 *3*	28	4406.8	
		5541.0 *6*	6	4009.4	
		5898.9 *5*	11	3652.8	
		5930.4 *7*	11	3622.8	
		5979.5 *3*	11	3570.1?	
		6061.1 *5*	28	3491.6	
		6229 *1*	6	3319.99	
		6309.1 *7*	11	3240.97	
		6387.8 *4*	11	3163.7	
		6463.0 *8*	6	3090.4	(7/2$^-$)
9549.70	(3/2$^-$)	6576.3 *8*	28	2973.0	
		6586.1 *4*	28	2963.1	
		6731.6 *6*	11	2816.8	(3/2$^-$,5/2,7/2$^-$)
		6767.3 *9*	11	2781.7	(5/2$^-$)
		6779.3 *6*	11	2770.2	(3/2$^-$,5/2$^-$)
		6834.9 *5*	11	2713.1	1/2$^+$
		6967.7 *3*	78	2581.71	(3/2$^-$,5/2,7/2$^-$)
		7072.0 *4*	22	2478.7	(5/2)$^-$
		7465.0 *6*	11	2087.2	(5/2$^-$)
		8067.5 *5*	11	1481.72	5/2$^-$
		8115.9 *4*	50	1434.256	1/2$^-$
		8258.3 *3*	100	1291.605	3/2$^-$
		8450.6 *5*	17	1099.256	3/2$^-$
		9548.7 *4*	28	0.0	7/2$^-$
9553.13	(3/2$^-$)	5044.4 *2*	15	4506.8	
		5140.4 *7*	5	4412.1	
		5145.8 *4*	10	4406.8	
		5543.0 *5*	10	4009.4	
		6063.2 *7*	10	3491.6	
		6390.9 *6*	10	3163.7	
		6411 *1*	10	3141.03	(7/2$^-$)
		6579.8 *3*	15	2973.0	
		6590.4 *6*	20	2963.1	
		6724.5 *4*	10	2829.1	
		6781.8 *3*	10	2770.2	(3/2$^-$,5/2$^-$)
		6838.9 *4*	10	2713.1	1/2$^+$
		6970.3 *2*	100	2581.71	(3/2$^-$,5/2,7/2$^-$)
		7075.1 *6*	10	2478.7	(5/2)$^-$
		7467.0 *3*	15	2087.2	(5/2$^-$)
		8071.5 *2*	25	1481.72	5/2$^-$
		8119.2 *2*	95	1434.256	1/2$^-$
		8261.6 *2*	85	1291.605	3/2$^-$
		8454.0 *2*	25	1099.256	3/2$^-$
		9552.8 *5*	5	0.0	7/2$^-$

† Only β^- decay, (^{15}N,4nγ), (γ,γ), (α,pγ) and (p,γ) provide measured Eγ. Data are from (p,γ), except as noted; however, data from this source are consistently low and have, therefore, been excluded from adopted gammas whenever other data are available. Since Eγ data for most transitions seen in (n,n$'\gamma$) or (p,p$'\gamma$) were not enumerated by the authors, adopted Eγ values for these transitions have been deduced from adopted level-energy differences and these are indicated with footnotes; no recoil correction has been made (≤0.1 keV for energies involved).

‡ From level-energy difference; Eγ data not enumerated in (n,n$'\gamma$) or (p,p$'\gamma$). Eγ not corrected for recoil (correction≤0.1 keV).

$^{59}_{27}Co_{32}$-16

Adopted Levels, Gammas (continued)

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

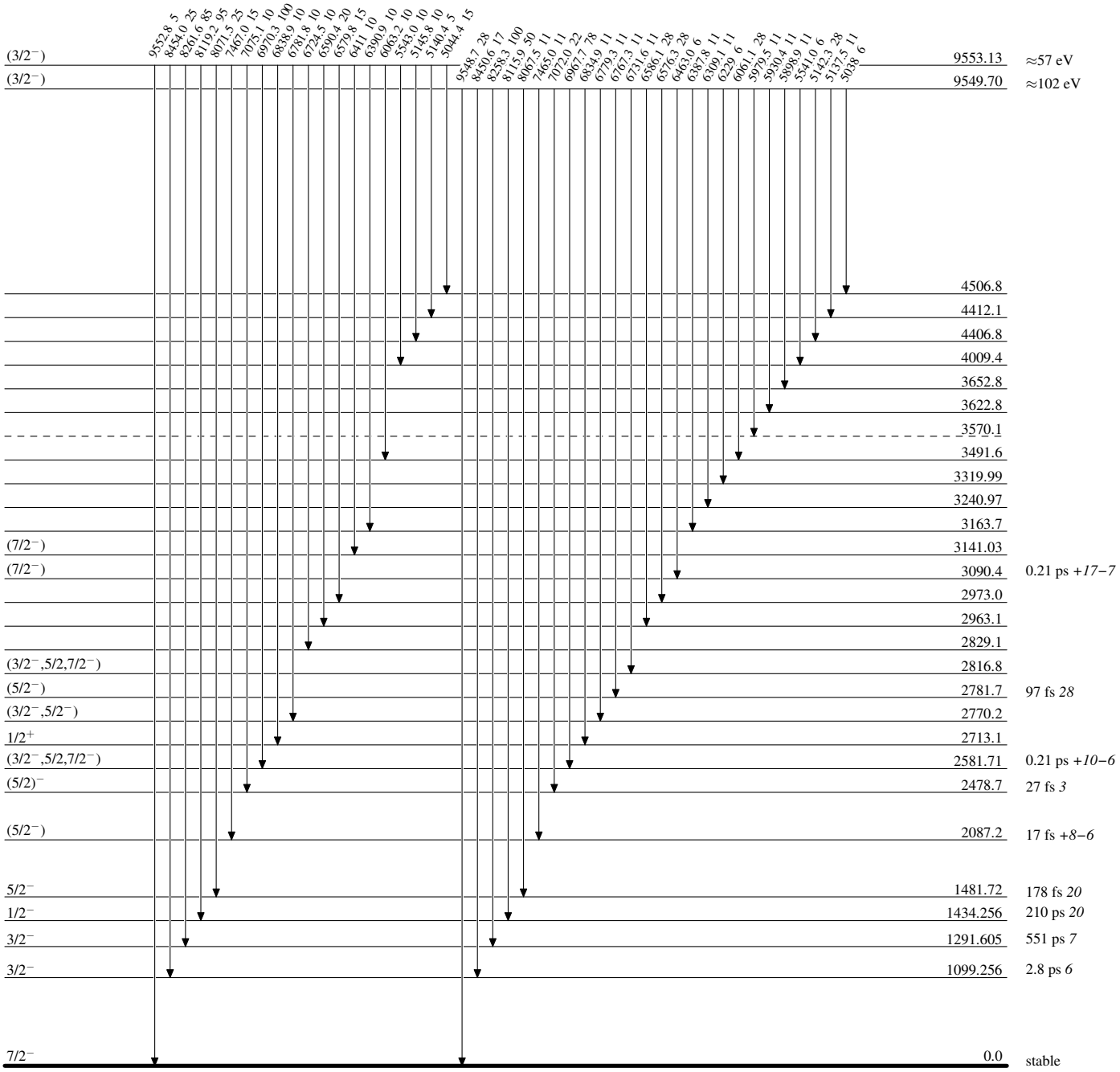
From ^{59}Fe β^- decay.
@ From (^{15}N,4nγ).
& Weighted average of available data, except as noted, for E(level)<2400. (branching data are available from β- decay, (^{15}N,4nγ), (α,pγ), (n,n$'\gamma$), and/or (p,p$'\gamma$)). From (n,n$'\gamma$), except as noted, for E(level)=2400-3700. From (p,γ) for E(level)>9500.
a From (p,p$'\gamma$).
b From $\gamma(\theta)$ in (α,pγ), except as noted.
c Additional information 53.
d 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.
e Placement of transition in the level scheme is uncertain.

$^{59}_{27}Co_{32}$-17

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

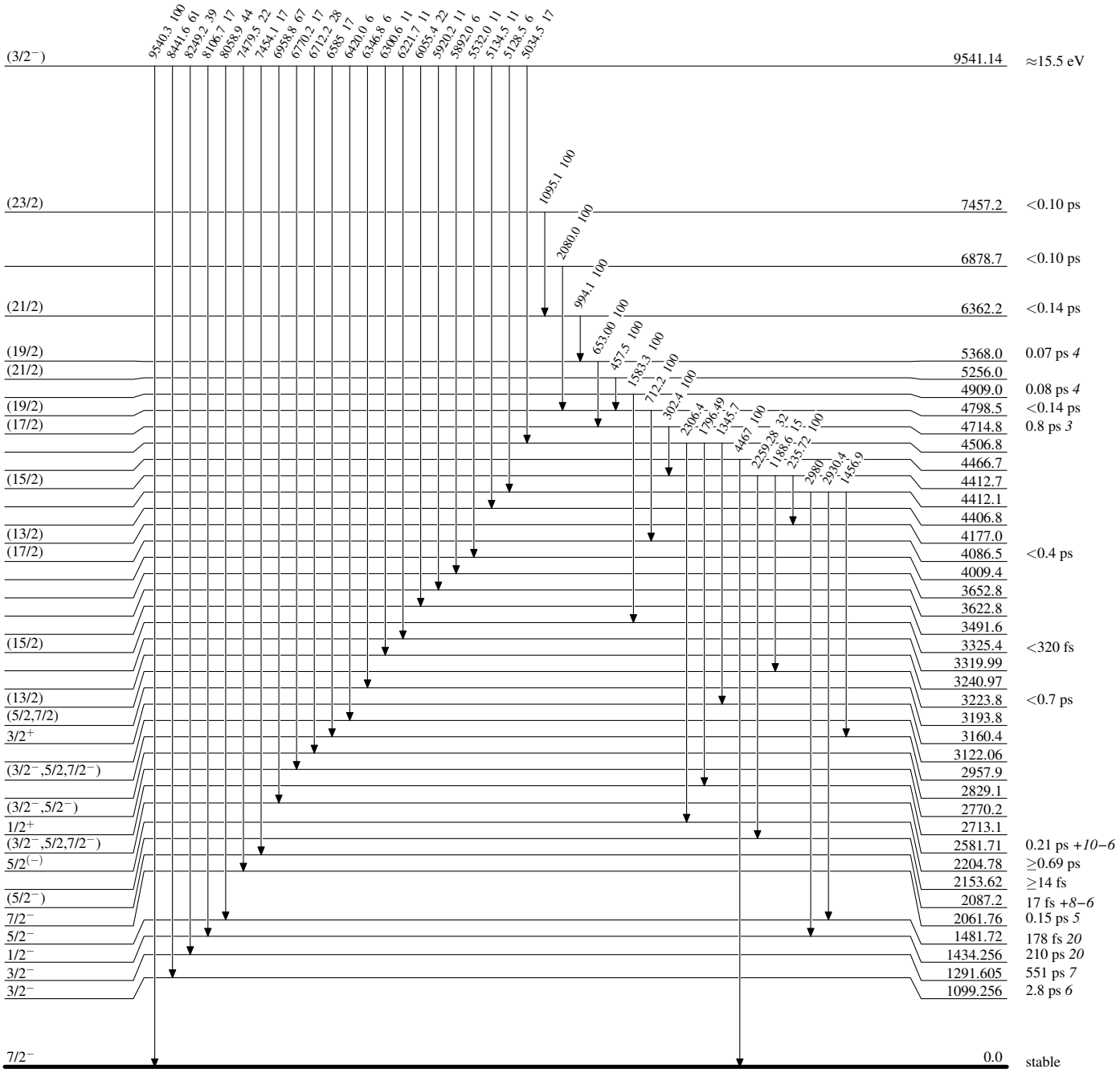


$^{59}_{27}Co_{32}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{59}_{27}Co_{32}$

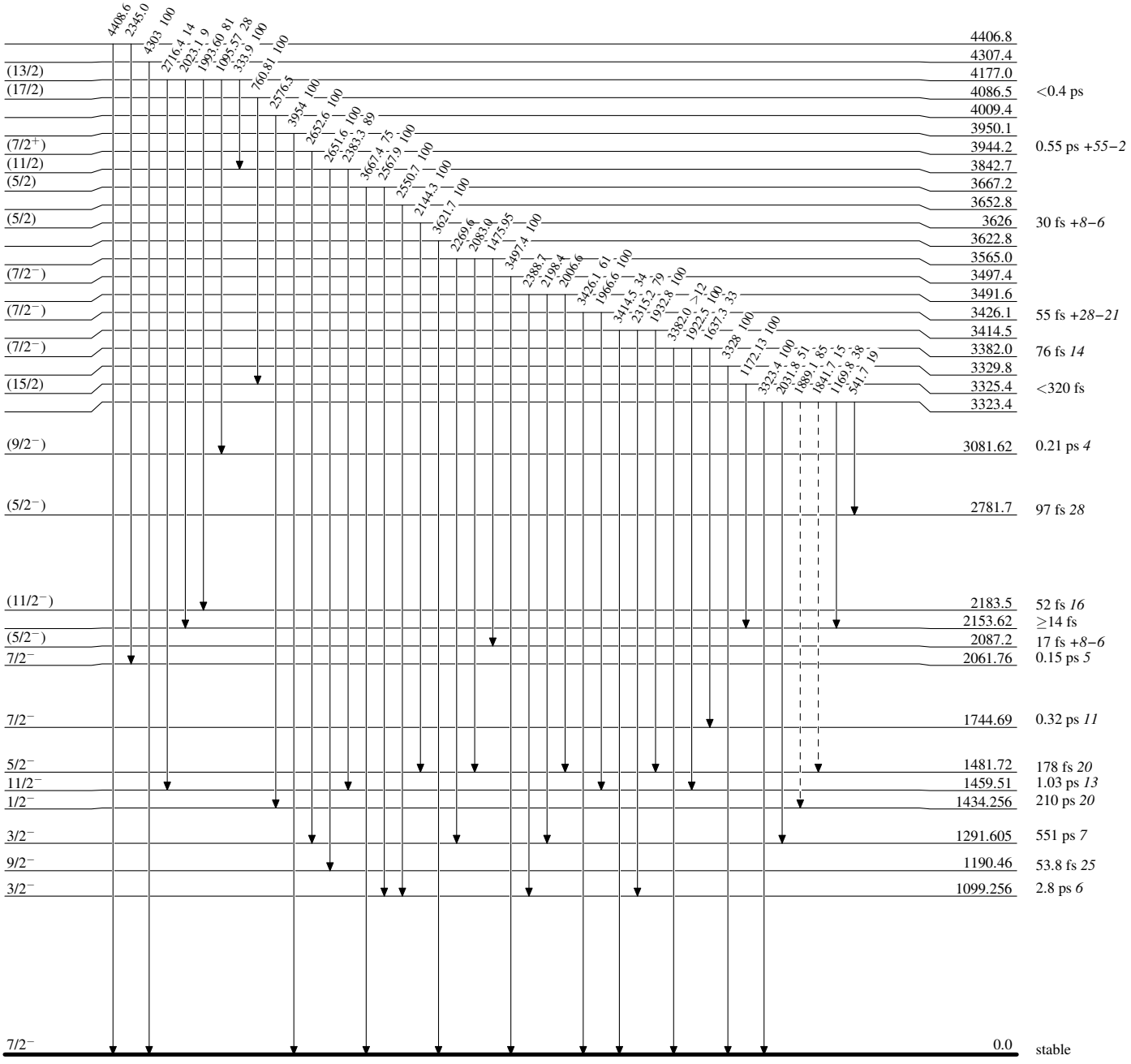
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{59}_{27}Co_{32}$

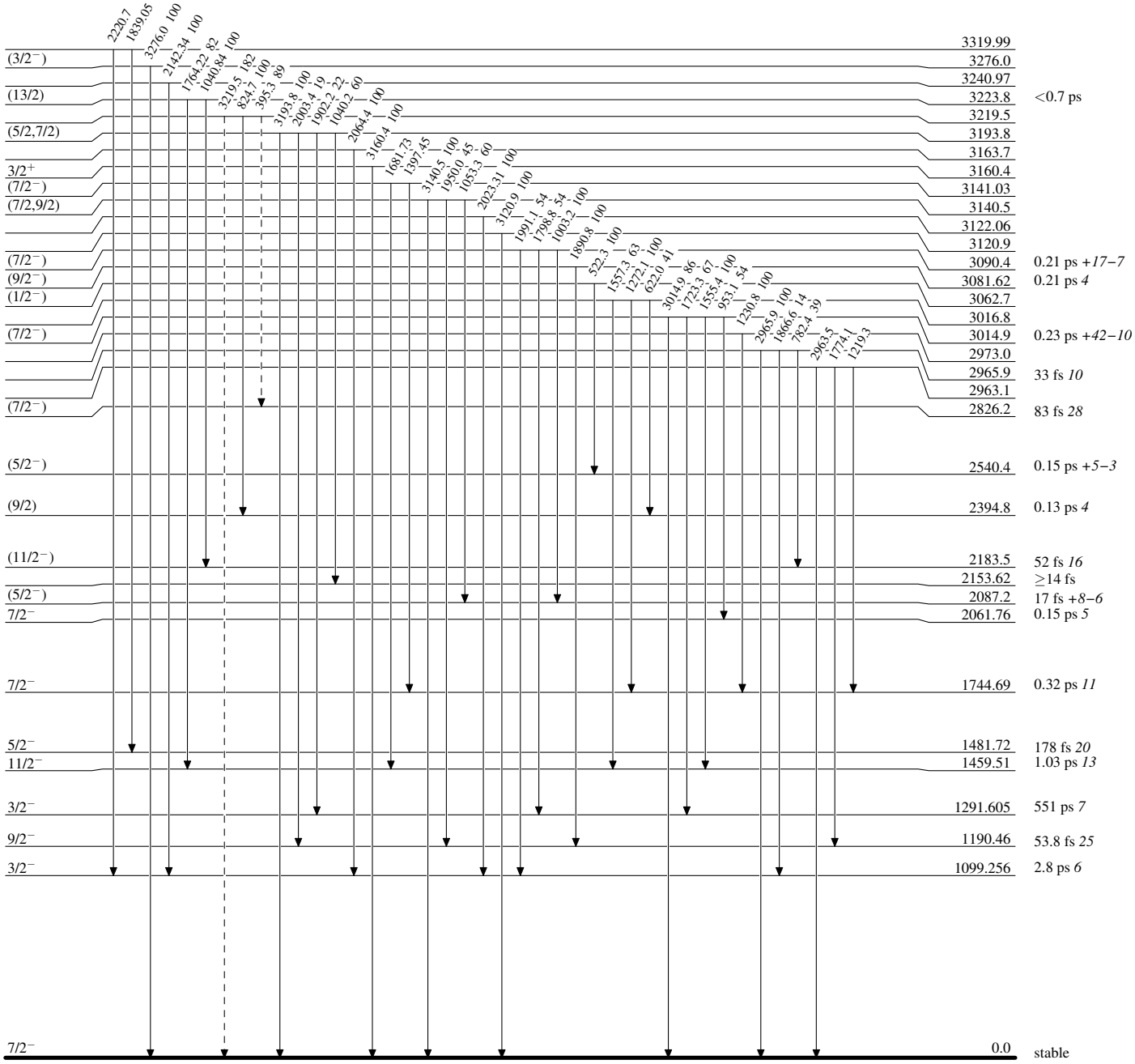
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{59}_{27}Co_{32}$

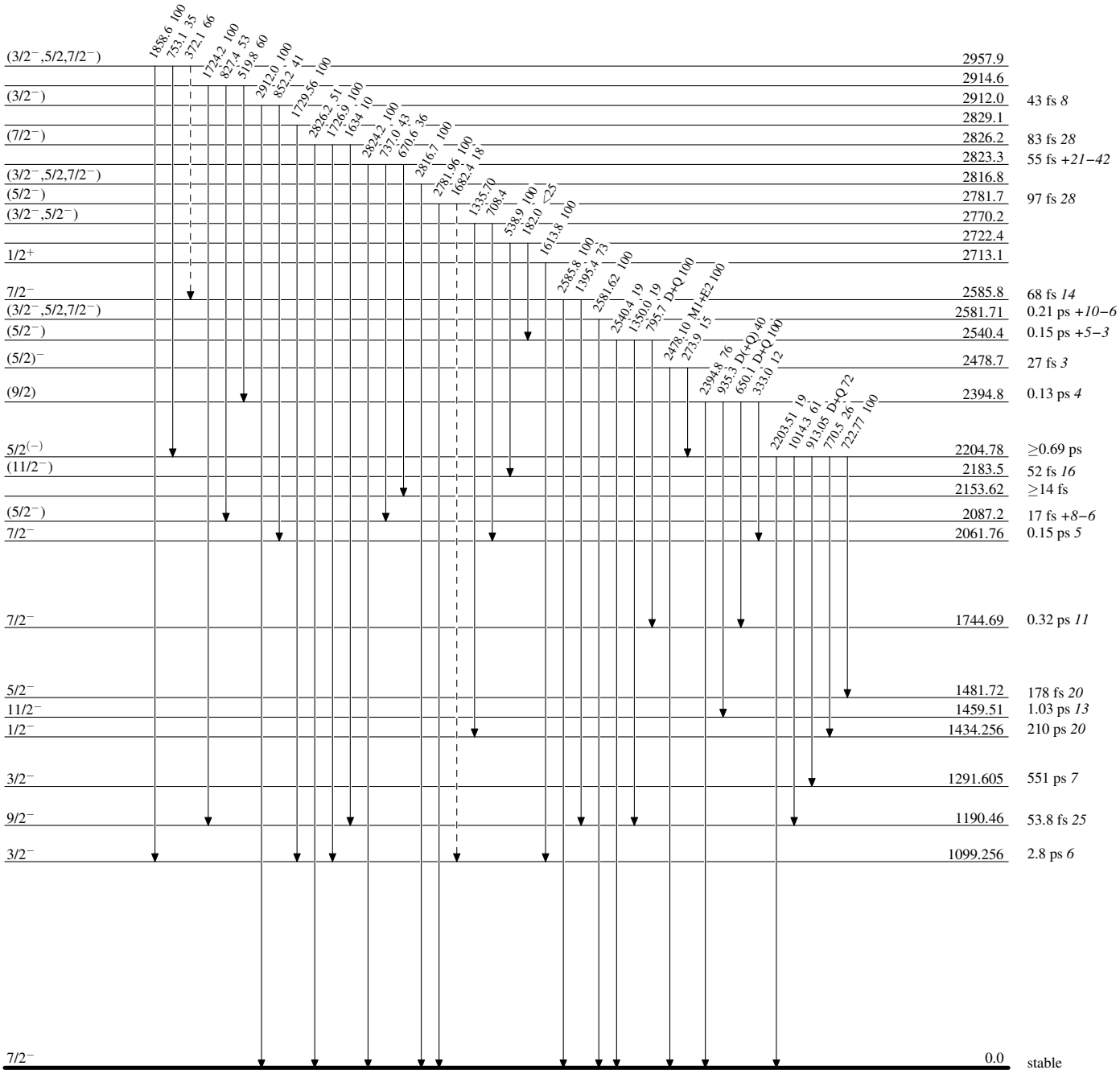
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{59}_{27}Co_{32}$

Legend

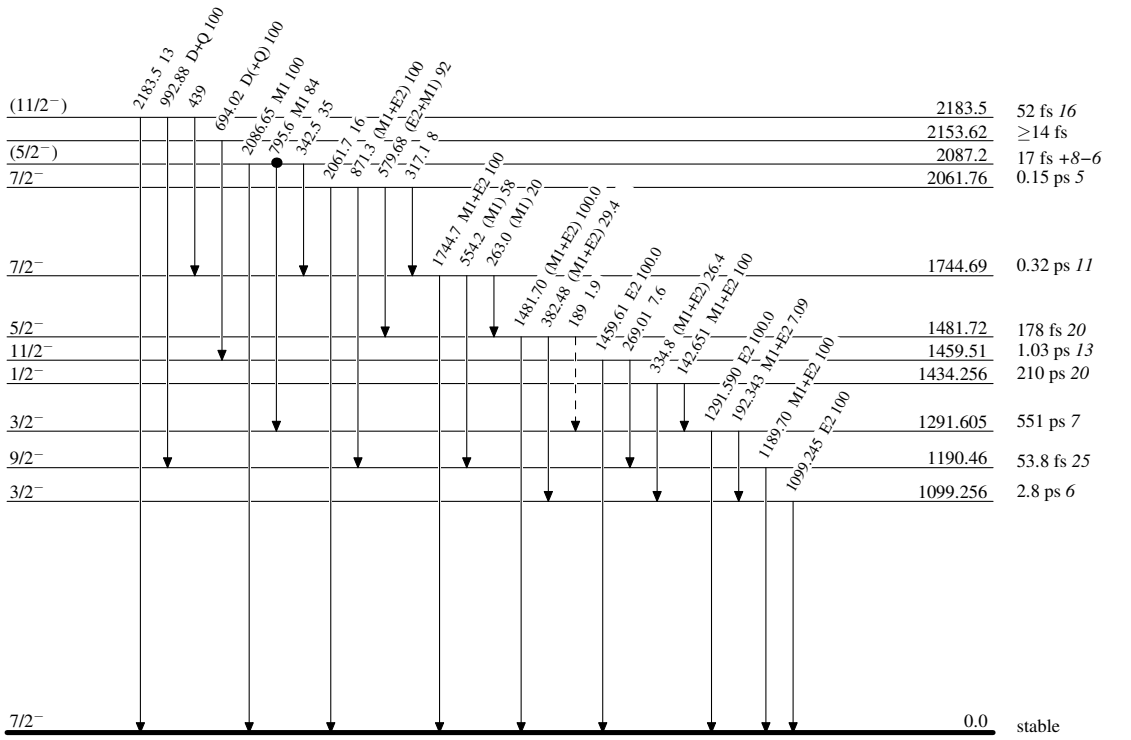
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

● Coincidence



$^{59}_{27}Co_{32}$