^{59}Co(γ,γ) 1971Sw06,1981Ca10

History

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

Others: 1964Bo22, 1975Bo40, 1984Al15.
1971Sw06: E(bremsstrahlung)≈1-4.6 MeV. Measured self-absorption and scattering, θ=98° and 127°, semi.
1981Ca10: E(bremsstrahlung)≈0.5-1.65 MeV. Measured self-absorption and scattering, θ=123°, semi. (see also 1975Bo40).
For intermediate structure between 5 and 14 MeV excited in (γ,γ) and (γ,γ') reactions, see 1984Al15.
Data below are from 1971Sw06 except as noted.

^{59}Co Levels

E(level)	J$^\pi$[†]	T$_{1/2}$[#]	$\Gamma^2_{\gamma0}/\Gamma$[‡]	Comments
0.0	7/2$^-$			
1098.7 *5*	3/2$^-$	2.7 ps *6*	0.146 *26*	T$_{1/2}$: From τ=3.96 ps *83*, unweighted average of 4.79 ps *55* (1981Ca10) and 3.13 ps *60* (from Γ_0=0.21 meV *4* in 1971Sw06 and Γ_0/Γ=1). $\Gamma^2_{\gamma0}/\Gamma$: 0.11 *2* (1971Sw06), 0.138 *16* (1981Ca10).
1189.6 *5*	9/2$^-$	53.7 fs *25*		T$_{1/2}$: from $\Gamma_{\gamma0}$=8.5×10^{-3} eV *4*, weighted average of 8.2×10^{-3} eV *9* (1971Sw06) and 9.0×10^{-3} eV *4* (1981Ca10). Uncertainty lowest input value.
1458.8 *3*	11/2$^-$	0.94 ps *13*	0.40 *6*	T$_{1/2}$: From τ=1.35 ps *19*, weighted average of 1.19 ps *14* (from 1.17 ps *14* – 1981Ca10) and 1.57 ps *16* (from Γ_0=0.39 meV *4* in 1971Sw06 using Γ_0/Γ=0.929).
1480.4 *3*	5/2$^-$	190 fs *20*	1.49 *16*	T$_{1/2}$: From τ=0.27 ps *3*, unweighted average of 0.242 ps *30* (from 0.254 ps *31* – 1981Ca10) and 0.299 ps *30* (from Γ_0=1.68 meV *17* in 1971Sw06 using Γ_0/Γ=0.763).
1745 *1*	7/2$^-$	0.38 ps *11*	0.39 *12*	T$_{1/2}$: from $\Gamma_{\gamma0}$=6.6×10^{-2} eV *19* (1971Sw06) and Γ_0/Γ=0.555.
2479 *1*	(5/2)$^-$	23 fs *3*	15.2 *8*	T$_{1/2}$: From $\Gamma^2_{\gamma0}/\Gamma$ (from 1971Sw06 assuming J=5/2 and W(θ)=1.010 *9*) and Γ_0/Γ=0.87 *10*.
2783 *1*	(5/2$^-$)			$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=15.0×10^{-3} eV *10* (1971Sw06).
2825 *1*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=4.8×10^{-3} eV *6* (1971Sw06).
2966 *1*		33 fs *10*	5.4 *16*	T$_{1/2}$: From $\Gamma^2_{\gamma0}/\Gamma$ (from 1971Sw06 assuming J=3/2 and W(θ)=1.00 and Γ_0/Γ=0.65). Uncertainty does not include that for branching (2966γ).
3328 *2*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=6.2×10^{-3} eV *12* (1971Sw06).
3625 *2*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=8.5×10^{-3} eV *22* (1971Sw06).
3667 *2*	(5/2)			$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=16.6×10^{-3} eV *24* (1971Sw06).
3954 *3*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=12.3×10^{-3} eV *24* (1971Sw06).
4303 *3*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=17.1×10^{-3} eV *47* (1971Sw06).
4467 *3*				$\Gamma^2_{\gamma0}/\Gamma$: W($\theta$)g$\Gamma^2_{\gamma0}/\Gamma$=42.2×10^{-3} eV *63* (1971Sw06).

[†] From Adopted Levels.
[‡] $\Gamma^2_{\gamma0}/\Gamma$ (meV) from scattering; weighted average of data from 1971Sw06 (10% systematic uncertainty included) and 1981Ca10, except as noted.
[#] From mean lifetime in 1981Ca10, based on measured value of W(θ)g$\Gamma^2_{\gamma0}/\Gamma$ – considering known spin and W(θ), except as noted. Evaluator updated the values for any changes of Γ_0 compared to data in 1981Ca10.

γ(^{59}Co)

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$[†]	E$_f$	J$_f^\pi$	Mult.	δ[‡]	Comments
1098.7	3/2$^-$	1098.7 *5*	100	0.0	7/2$^-$			
1189.6	9/2$^-$	1189.6 *5*	100	0.0	7/2$^-$	D+Q	0.16 *9*	
1458.8	11/2$^-$	1458.8 *3*	92.9 *7*	0.0	7/2$^-$			
1480.4	5/2$^-$	1480.4 *3*	76.3 *15*	0.0	7/2$^-$	D(+Q)	<0.35	δ: From Table 1 in 1971Sw06. In text δ(D,Q)>−0.4 or <+0.1.

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^{59}Co(γ,γ) 1971Sw06,1981Ca10 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.	δ[‡]	Comments
1745	$7/2^-$	1745 *1*	55.5 *17*	0.0	$7/2^-$			
2479	$(5/2)^-$	2479 *1*	87 *10*	0.0	$7/2^-$	M1+E2	−0.28 *20*	Mult.,δ: adopted values.
2783	$(5/2^-)$	2783 *1*		0.0	$7/2^-$			
2825		2825 *1*		0.0	$7/2^-$			
2966		2966 *1*	65	0.0	$7/2^-$			
3328		3328 *2*		0.0	$7/2^-$			
3625		3625 *2*		0.0	$7/2^-$			
3667	(5/2)	3667 *2*		0.0	$7/2^-$			
3954		3954 *3*		0.0	$7/2^-$			
4303		4303 *3*		0.0	$7/2^-$			
4467		4467 *3*		0.0	$7/2^-$			

[†] % photon branching, from adopted gammas.
[‡] From 1971Sw06.

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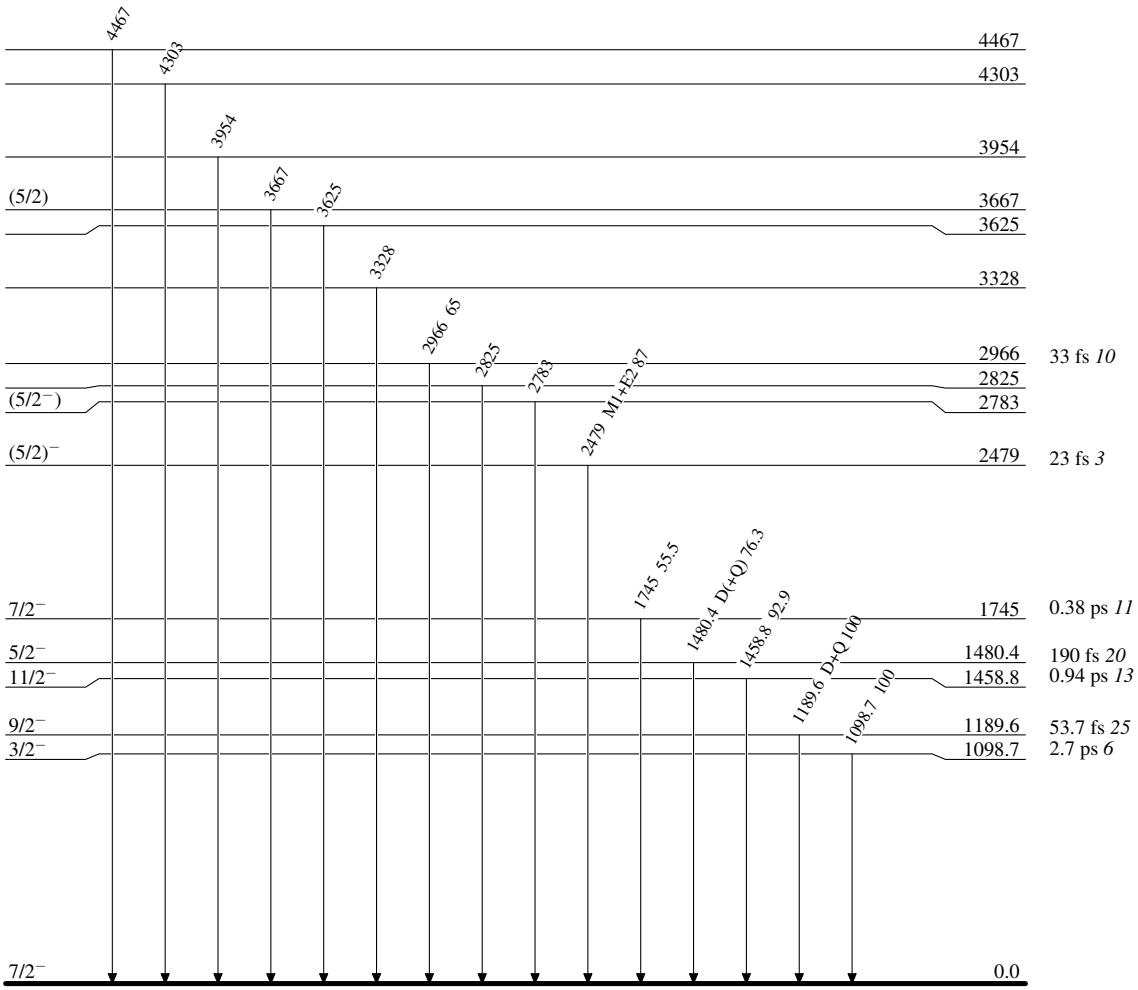
Level Scheme

Intensities: % photon branching from each level



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