^{66}Zn(γ,γ') 1968Sh14,1972Me14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 111, 1093 (2010)	3-Mar-2009

1968Sh14, 1969Sh10: photoexcitation of 7368 resonance with Pb n-capture γ rays; measured $\gamma(\theta)$.
1972Me14: electron bremsstrahlung, Eγ<4.9 MeV; σ(Eγ,θ) at θ=98° and 127°; deduced Γ's; Ge(Li), NaI detectors.
1973Sz02: photoexcitation of 7694 resonance, source is (n,γ) in Ni, $\gamma(\theta)$ (at θ=90° and 135°) and Γ's.
1977Ca14, 1981Ca10: bremsstrahlung excitation; measured level Γ by nuclear resonance fluorescence.
1972Ka22: nuclear resonance scattering using a ^{66}Cu source; measured $T_{1/2}$ of 1039 level.
1967Be39: nuclear resonance scattering using a ^{66}Cu source; measured $T_{1/2}$ of 1039 level.
1972ArZD: nuclear resonance fluorescence with bremsstrahlung; level widths of several nuclei.
1970Sc27: resonance scattering of neutron capture γ rays; level widths.
Others: 1971Be22, 1973BeXX.
Primary transitions have been assumed to be of a predominantly dipole nature.

^{66}Zn Levels

E(level)†	J$^\pi$‡	$T_{1/2}$#	Comments
0	0^+		
1039.2 *4*	2^+	1.74 ps *11*	$T_{1/2}$: from $\Gamma=0.262\times10^{-3}$ eV *16*; this is the weighted average of 0.243×10^{-3} eV *21* (1981Ca10), 0.33×10^{-3} eV *9* (1967Be39), 0.30×10^{-3} eV *4* (1972Ka22), and 0.27×10^{-3} eV *3* (1972ArZD).
1873.6	2^+		J$^\pi$: 2 from $\gamma(\theta)$ of 5495γ (1968Sh14).
2371.9	0^+		
2763 *1*	(2)		J$^\pi$: (2) from $\gamma(\theta)$ (1968Sh14).
2777.8	2^+	0.25 ps *+8–5*	$\Gamma_{\gamma0}=1.2\times10^{-3}$ eV *3* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.77$ *4* (1971Ca14) J$^\pi$: 2 from resonance fluorescence yield (1972Me14), (1) from $\gamma(\theta)$ (1968Sh14).
2938.1 *4*	2^+		J$^\pi$: J=(2) from $\gamma(\theta)$ (1968Sh14), J=(0^+) from $\gamma(\theta)$ and transition strength (1973Sz02).
3105.8 *8*	0^+		J$^\pi$: 0 from $\gamma(\theta)$ of 4262γ (1968Sh14).
3212.6 *4*	2^+		J$^\pi$: (0^+) from $\gamma(\theta)$ and transition strength (1973Sz02).
3226.7			
3240.6 *8*			
3331.7 *6*	2^+		J$^\pi$: (0^+),(2^+) from $\gamma(\theta)$ and transition strength (1973Sz02).
3381.1	$1^{(-)}$	20 fs *5*	$\Gamma_{\gamma0}=16\times10^{-3}$ eV *3* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.69$ (1971Ca14) J$^\pi$: 1 from $\gamma(\theta)$ (1972Me14).
3430.0 *5*	$1^{(-)}$	30 fs *+19–8*	$\Gamma_{\gamma0}=8\times10^{-3}$ eV *3* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.51$ (1971Ca14)
3506.3 *7*	2^+		
3530.5	0^+		J$^\pi$: 0 from $\gamma(\theta)$ of 2494γ (1968Sh14).
3576.9?	4^+		
3739.1	1	14@ fs *2*	$\Gamma_{\gamma0}=24\times10^{-3}$ eV *3* (1972Me14) $T_{1/2}$: calculated with $\Gamma_{\gamma0}/\Gamma=0.75$ *3* from adopted gammas. J$^\pi$: 1 from $\gamma(\theta)$ (1972Me14).
3823.7	0		J$^\pi$: 0 from $\gamma(\theta)$ of 3544γ (1968Sh14).
3880.7	(2)		J$^\pi$: (2) from $\gamma(\theta)$ (1968Sh14).
4011.7?			
4074.7?	(6^-)		
4295.1	1^+	4.2 fs *+18–9*	$\Gamma_{\gamma0}=67\times10^{-3}$ eV *20* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.60$ (1971Ca14)
4426.2	1	7.0@ fs *12*	$\Gamma_{\gamma0}=65\times10^{-3}$ eV *10* (1972Me14) J$^\pi$: 1 from $\gamma(\theta)$ (1972Me14).
4462.2	1^+	7 fs *+21–3*	$\Gamma_{\gamma0}=28\times10^{-3}$ eV *21* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.29$ (1971Ca14)
4609? *2*	(1)	8.4@ fs *+33–18*	$\Gamma_{\gamma0}=54\times10^{-3}$ eV *15* (1972Me14) J$^\pi$: (1) from $\gamma(\theta)$ (1972Me14).
4635.7	(2)		J$^\pi$: (2) from $\gamma(\theta)$ (1968Sh14).
4685? *2*	(1)	7.1@ fs *+24–14*	$\Gamma_{\gamma0}=64\times10^{-3}$ eV *16* (1972Me14) J$^\pi$: (1) from $\gamma(\theta)$ (1972Me14).

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^{66}Zn(γ,γ') 1968Sh14,1972Me14 (continued)

^{66}Zn Levels (continued)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
4806? *2*	1$^+$	3.8 fs *+13−8*	$\Gamma_{\gamma0}=100\times10^{-3}$ eV *25* (1972Me14); $\Gamma_{\gamma0}/\Gamma=0.81$ (1971Ca14)
7367.8	1	1.47 fs *16*	$\Gamma_{\gamma0}=0.22$ eV *2* (1969Sh10); $\Gamma_{\gamma0}/\Gamma=0.71$ (1968Sh14) T$_{1/2}$: from $\Gamma=0.31$ eV *3* (1969Sh10). J$^\pi$: 1 from $\gamma(\theta)$ (1968Sh14).
7693.1	1	2.2 fs *4*	$\Gamma=0.21$ eV *4* (1970Sc27); $\Gamma_{\gamma0}=0.10$ eV *2* (1970Sc27) J$^\pi$: 1 from $\gamma(\theta)$ (1973Sz02). T$_{1/2}$: calculated from measured Γ (1970Sc27).

[†] Levels with ΔE are from 1973Sz02; those without ΔE are from an unweighted least-squares fit to Eγ data while holding fixed energies of the levels from 1973Sz02.
[‡] From Adopted Levels; supporting arguments from this data set are indicated.
[#] Calculated from measured $\Gamma_{\gamma0}/\Gamma$ (1972Me14) and adopted γ branchings, except as noted.
[@] $\Gamma_{\gamma0}/\Gamma=1$ assumed in absence of branching data.

γ(^{66}Zn)

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
835	26 *8*	1873.6	2$^+$	1039.2	2$^+$	
1039	39 *12*	1039.2	2$^+$	0	0$^+$	
1234	6.8 *20*	3105.8	0$^+$	1873.6	2$^+$	
1507[&]	0.9 *4*	3880.7	(2)	2371.9	0$^+$	
1899	2.1 *8*	2938.1	2$^+$	1039.2	2$^+$	
2005	1.1 *5*	3880.7	(2)	1873.6	2$^+$	
2067[&]	<0.7	3105.8	0$^+$	1039.2	2$^+$	
2494	2.0 *10*	3530.5	0$^+$	1039.2	2$^+$	
2732	1.9 *12*	7367.8	1	4635.7	(2)	
2762[@]	2.1[@] *9*	2763	(2)	0	0$^+$	
2762[@&]	2.1[@] *9*	4635.7	(2)	1873.6	2$^+$	
2779	2.5 *8*	2777.8	2$^+$	0	0$^+$	
2941	1.5 *5*	2938.1	2$^+$	0	0$^+$	
3071[&]	2.1 *12*	7367.8	1	4295.1	1$^+$	
3293[&]	≈0.5	7367.8	1	4074.7?	(6$^-$)	
3356[&]	0.4 *2*	7367.8	1	4011.7?		
3381	1.9 *7*	3381.1	1$^{(-)}$	0	0$^+$	
3433[#&]		3430.0	1$^{(-)}$	0	0$^+$	
3485	2.1 *7*	7367.8	1	3880.7	(2)	
3544	1.6 *5*	7367.8	1	3823.7	0	
3579[&]	0.5 *3*	3576.9?	4$^+$	0	0$^+$	
3739[#]		3739.1	1	0	0$^+$	
3793[&]	≈0.5	7367.8	1	3576.9?	4$^+$	
3840	1.6 *7*	7367.8	1	3530.5	0$^+$	
4141	1.0 *6*	7367.8	1	3226.7		
4187	8 *2*	7693.1	1	3506.3	2$^+$	
4262	8.1 *20*	7367.8	1	3105.8	0$^+$	
4263	25 *3*	7693.1	1	3430.0	1$^{(-)}$	I$_\gamma$: 29 *5* for Eγ=4253 (1970Sc27).
4295[#]		4295.1	1$^+$	0	0$^+$	
4361	13 *2*	7693.1	1	3331.7	2$^+$	
4426[#]		4426.2	1	0	0$^+$	

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^{66}Zn(γ,γ') 1968Sh14,1972Me14 (continued)

$\gamma(^{66}Zn)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
4428	2.1 *6*	7367.8	1	2938.1	2^+	
4452	7 *2*	7693.1	1	3240.6		
4462[#]		4462.2	1^+	0	0^+	
4480	21 *2*	7693.1	1	3212.6	2^+	I_γ: 23 *4* for Eγ=4467 (1970Sc27).
4587	8 *1*	7693.1	1	3105.8	0^+	I_γ: 12 *4* for Eγ=4579 (1970Sc27).
4591	3.8 *12*	7367.8	1	2777.8	2^+	
4609[#&]		4609?	(1)	0	0^+	
4685[#&]		4685?	(1)	0	0^+	
4755	24 *2*	7693.1	1	2938.1	2^+	I_γ: 17 *4* for Eγ=4742 (1970Sc27).
4806[#&]		4806?	1^+	0	0^+	
4930	<2	7693.1	1	2763	(2)	I_γ: 8 *3* for Eγ=4910 (1970Sc27).
4995[&]	≤0.4	7367.8	1	2371.9	0^+	
5321	<3	7693.1	1	2371.9	0^+	I_γ: 3.8 *24* for Eγ=5309 (1970Sc27).
5495	14.3 *7*	7367.8	1	1873.6	2^+	
5819	<2	7693.1	1	1873.6	2^+	I_γ: 5.3 *22* for Eγ=5829 (1970Sc27).
6326	≈0.3	7367.8	1	1039.2	2^+	
6654	42 *1*	7693.1	1	1039.2	2^+	I_γ: 51 *3* for Eγ=6657 (1970Sc27).
7368	100	7367.8	1	0	0^+	
7693	100 *1*	7693.1	1	0	0^+	

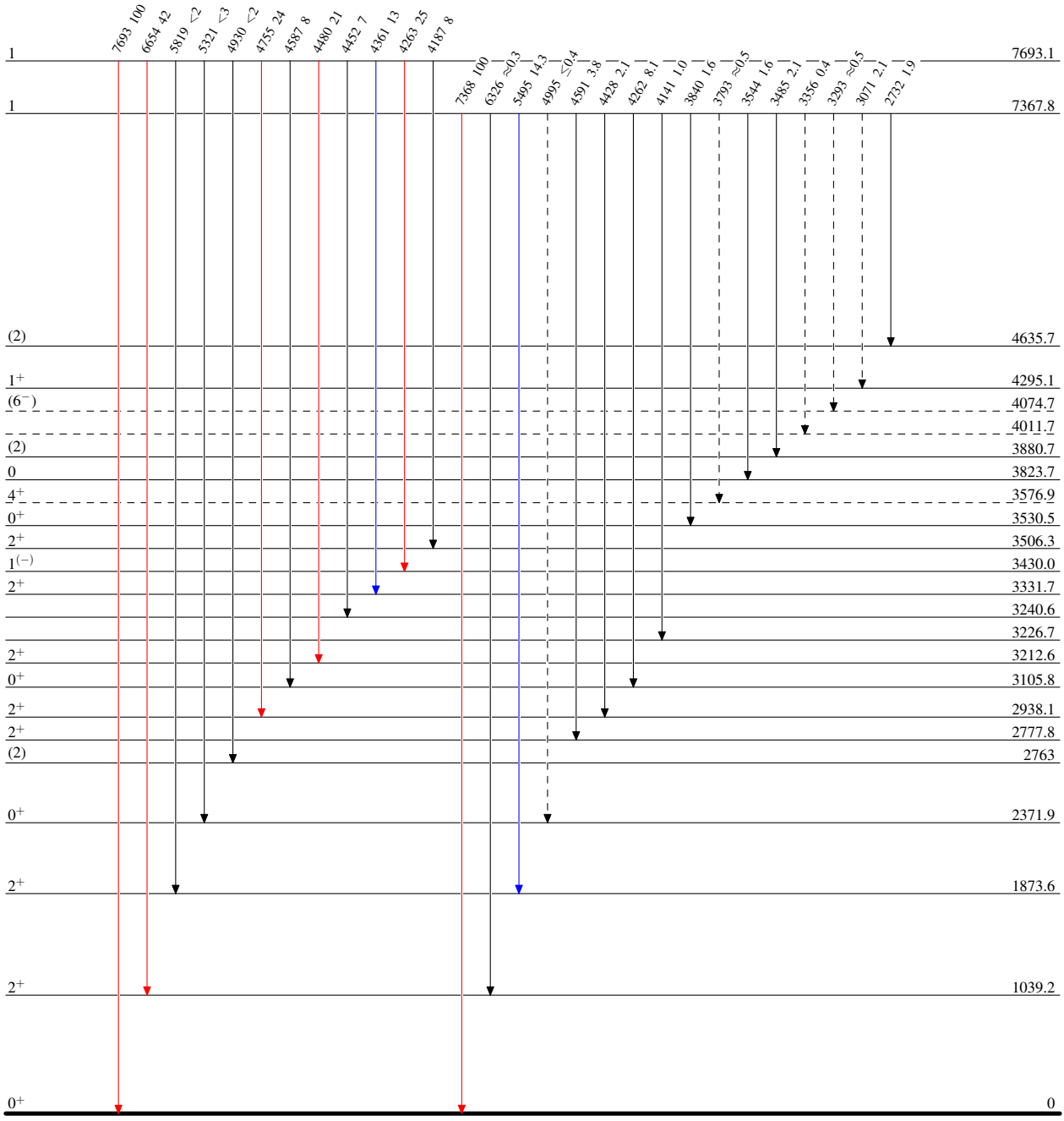
[†] γ's depopulating the 7694 level are from 1973Sz02. Other γ's are from 1968Sh14, except as noted.
[‡] Relative intensities, γ's depopulating the 7693 level they are from 1973Sz02. Data for the rest of the γ's are from 1968Sh14.
[#] From 1972Me14; intensity not given by authors.
[@] Multiply placed with undivided intensity.
[&] Placement of transition in the level scheme is uncertain.

^{66}Zn(γ,γ′) 1968Sh14,1972Me14

Level Scheme

Intensities: Relative to the ground state transition As 100 for primary or secondary transitions from the 7368 and 7693 levels respectivelySecondary transitions from the 7368 a

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



$^{66}_{30}Zn_{36}$

^{66}Zn(γ,γ′) 1968Sh14,1972Me14

Level Scheme (continued)

Intensities: Relative to the ground state transition As 100 for primary or secondary transitions from the 7368 and 7693 levels respectively Secondary transitions from the 7368 a
& Multiply placed: undivided intensity given