Adopted Levels, Gammas

History

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

Q(β^-)=−5175 *3*; S(n)=11058.6 *10*; S(p)=8924.6 *10*; Q(α)=−4578.1 *8* 2012Wa38
Note: Current evaluation has used the following Q record −5175 3 *11058.9 108924.5 10*−4578.1 *8* 2009AuZZ,2003Au03.
Additional information 1.

^{66}Zn Levels

Configuration: configurations used in DWBA analysis of (α,^{2}He), (^{12}C,^{10}C), and (^{12}C,^{10}Be) data.

Cross Reference (XREF) Flags

A	^{66}Cu β^- decay	K	^{69}Ga(p,α)	U	Coulomb excitation
B	^{66}Ga ε decay	L	^{65}Cu(d,n)	V	^{67}Zn(d,t)
C	^{64}Ni(α,2nγ), ^{55}Mn(^{14}N,2pnγ)	M	^{67}Zn(p,d)	W	^{62}Ni(^{6}Li,d)
D	^{66}Zn(p,p′)	N	^{68}Zn(p,t)	X	^{64}Ni(^{16}O,^{14}C)
E	^{66}Zn(γ,γ')	O	^{64}Zn(t,p)	Y	^{64}Ni(^{3}He,n)
F	^{66}Zn(p,p′γ)	P	^{65}Cu(^{3}He,d)	Z	^{65}Cu(α,t)
G	^{65}Cu(p,γ)	Q	^{66}Zn(α,α')	Others:	
H	^{66}Zn(n,n′γ)	R	Inelastic scattering	AA	^{64}Zn(α,^{2}He)
I	^{65}Cu(p,n), (p,nγ) IAR	S	^{66}Zn(e,e′)	AB	^{64}Ni(^{12}C,^{10}Be), ^{64}Zn(^{12}C,^{10}C)
J	^{63}Cu(α,p), (α,pγ)	T	^{66}Zn(α,$\alpha'\gamma$), (^{32}S,^{32}S′γ)	AC	^{63}Cu(^{6}He,p2nγ)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[‡]	XREF	Comments
0.0	0$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWXYZ	XREF: Others: AA, AB, AC Configuration=(ν f$_{5/2}$0$^+$)
1039.2279 *21*	2$^+$[@]	1.68 ps *3*	BCDEFGH JKLMNOPQRSTUVWX Z	XREF: Others: AA, AB, AC μ=+0.80 *8*; μ=+0.9 *2* (2005St24); Q=+0.24 *8* (2003Ko51) μ=+0.80 *8*, transient field integral perturbed angular correlation (tf) (2002Ke02). μ=+1.06 *10*, transient field integral perturbed angular correlation (tf) (2004An14). μ=+0.9 *2*, perturbed angular correlation after ion implantation (IMPAC) (1979Fa06). Q: from Coulomb excitation (2003Ko51). Other: +0.24 *9* (2020Ro06, from Coul. ex., preliminary value as stated by authors). Comment added March 30, 2021 by B. Singh. T$_{1/2}$: weighted average of 1.73 ps *7* DSAM (2006Le24), 1.68 ps *3* DSAM (2002Ke02), 1.61 ps *10* Coul ex. (2003Ko51), 1.74 ps *11* ^{66}Zn(γ,γ') (1998Ba02,1981Ca10,1972Ka22,1972ArZD,1967Be39), 1.56 ps *10* Coul ex. (1973Fi15), 1.66 ps *10* ^{66}Zn(e,e′) (1977Ne05). Other measurements: 1.3 ps *8* ^{63}Cu(α,pγ) (1974Iv01), 1.5 ps *7* ^{66}Zn(α,$\alpha'\gamma$) (1972Yo01), 1.7 ps *+35−14* ^{64}Ni(α,2nγ), <2 ns ^{66}Cu β^- decay (1953En06). Isotope shift: <r^2>$^{1/2}$=3.9496 *13* (2004An14).
1872.7653 *24*	2$^+$	0.19[a] ps *7*	ABCDEFGH JKLM OPQRSTUVWX	XREF: Others: AB, AC T$_{1/2}$: others: <1.4 ps from (α,$\alpha'\gamma$), and 0.83 ps *+35−21* from ^{64}Ni(α,2nγ), 1.7 ps *5* (2003Ko51).

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[‡]	XREF	Comments
2372.353 *4*	0$^+$	>0.21 ps	AB DEFGH Kl OP	T$_{1/2}$: from (n,n′γ); other: <60 ps from (p,p′γ).
2451.01 *5*	4$^+$[@]	0.34 ps *5*	CD FGH JKlM OPQR TUVW	XREF: Others: AB, AC J$^{\pi}$: 4 from γ(θ) in ^{64}Ni(α,2nγ); π from E2 γ to 2$^+$. T$_{1/2}$: weighted average of 0.19 ps *6* (α,pγ), 0.76 ps *14* Coul ex. (2006Le24), and 0.35 ps *2* Coul. ex. (2003Ko51). Others: 0.83 ps *+42−28* from (α,2nγ),0.19 ps *6* from (α,pγ), 0.17 ps *+5−3* from (n,n′γ), and <0.7 ps from (α,α′γ). μ=+2.6 *8*, transient field integral perturbed angular correlation (tf) (2004An14). μ=+2.6 *8*, from γ−factor=+0.65 *20* in Coul. ex. (2006Le24).
2703.6 *4*	(3)		CD FGH K VW	E(level): possible doublet indicated by conflicting parity measurements. J$^{\pi}$: (1$^-$,3$^-$) from proton-capture yield in ^{65}Cu(p,γ); (2$^-$,3$^-$) from L=(0) for a level at 2704 in ^{67}Zn(d,t); (3$^+$) from Hauser-Feshbach analysis in ^{66}Zn(p,p′).
2762.8 *6*	(2)		E	J$^{\pi}$: from γ(θ) in ^{66}Zn(γ,γ′).
2765.56 *7*	4$^+$	>7 ps	CD FGH JK mn U	XREF: Others: AC J$^{\pi}$: 4 from γ(θ) in ^{64}Ni(α,2nγ); π from L(p,p′)=4. T$_{1/2}$: by DSA from ^{64}Ni(α,2nγ). Other: >2.1 ps by DSA from ^{63}Cu(α,pγ).
2780.157 *7*	2$^+$	0.26 ps *7*	B DEFGH K mnOp V	T$_{1/2}$: weighted average of 0.25 ps *8* from (γ,γ′) and 0.28 ps *14* from (n,n′γ).
2826.69 *5*	3$^-$[@]	0.180 ps *7*	BCD FGH JK OpQRSTU WX Z	XREF: Others: AB, AC T$_{1/2}$: From Coul. ex. (2006LeZU). T$_{1/2}$: Others: 0.18 ps *4* from ^{66}Zn(α,α′γ), 0.23 ps *14* from ^{63}Cu(α,pγ), and 0.17 ps *4* from (n,n′γ). Other: 1.0 ps *+6−3* from ^{64}Ni(α,2nγ). μ=+2.1 *9*, transient field integral perturbed angular correlation (tf) (2004An14). μ=+2.1 *9*, from γ−factor=+0.7 *3* in Coul. ex. (2006Le24).
2938.074 *3*	2$^+$	0.044 ps *16*	B DEFGH JKLM OP V	T$_{1/2}$: unweighted average of 0.06 ps *5* from (α,pγ) and 0.028 ps *3* from (n,n′γ).
3030	(0$^+$)		W	J$^{\pi}$: from L(^{6}Li,d)=(0).
3077.73 *23*	4$^+$	1.04 ps *7*	CD FGH JK M OPQR TUV	XREF: Others: AB, AC Configuration=(π f$_{5/2}$4$^+$) T$_{1/2}$: Coul. ex. (2006Le24). T$_{1/2}$: 1.7 ps *+10−3* in ^{64}Ni(α,2nγ), 0.5 ps *+3−2* in (α,pγ), 0.13 ps *+56−10* in (α,α′γ), and 0.09 ps *+5−3* in (n,n′γ).
3105.040 *4*	0$^+$		B DEFGH K O	
3212.582 *8*	2$^+$	0.083 ps *+21−14*	B DEFGH K m O	T$_{1/2}$: from DSAM in (n,n′γ).
3226.2 *11*			DE K m R	
3228.885 *3*	1$^+$	0.12 ps *3*	B D FGH K P V	T$_{1/2}$: from DSAM in (n,n′γ). J$^{\pi}$: from log *ft*=6.14 *4* in ε decay from 0$^+$ and γ to 0$^+$; π=+ from M1,E2 to 2$^+$.
3241.2? *11*			E	
3331.441 *6*	2$^+$	0.083 ps *+21−14*	B DEFGH KLm O R V	T$_{1/2}$: from DSAM in (n,n′γ).
3380.944 *4*	1$^-$	20 fs *5*	B DEFGH K p V	T$_{1/2}$: other: 42 fs *+21−14* from DSA in (n,n′γ). J$^{\pi}$: 1 from γ(θ) in ^{66}Zn(γ,γ′); π from L(p,p′)=(1).

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
3427.406 *18*	1,2$^-$		B GH p	J^{π}: log *ft*=8.9 *1* from ε decay from 0$^+$; γ to 2$^+$.
3432.408 *4*	1$^-$	30 fs +*19*−*8*	B DEFGH K R	J^{π}: 0,1,2$^-$ from log *ft*=7.03 *4* in ε decay from 0$^+$; J=0 ruled out by γ to 0$^+$, J^{π}=2$^-$ ruled out by $T_{1/2}$; π=(−) from L(p,p′)=(1).
3507.249 *23*	2$^+$		B DEFGH K m V	J^{π}: L(p,p′)=2.
3523.6 *8*			CD FG K m o	
3531.692 *14*	0$^+$		B DEFG K o	
3576.370 *22*	4$^+$		B DEFGH K R	J^{π}: L(p,p′)=4.
3670.72 *5*	2$^+$		B D GH K m OP	
3689.01 *16*	1$^+$,2$^+$,3$^+$		D G KLm V	J^{π}: L(d,t)=L(d,n)=1.
3709.4 *3*	(5)	0.6[a] ps +*6*−*2*	CD G JK	J^{π}: from $\gamma(\theta)$ in ^{64}Ni(α,2nγ).
3725.3 *5*			D F K	
3731.6 *5*			G	
3738.207 *21*	+	14 fs *2*	B DEFGH K O	Lower J^{π} member of a J^{π}=(2$^+$)+(4$^+$) level doublet at 3737 *10* reported in ^{64}Zn(t,p). J^{π}: J^{π}=(2$^+$) from L(t,p)=(2) not adopted for this lower J^{π} member of 3737 *10* doublet since J=1 from $\gamma(\theta)$ and reduced dipole γ rays in ^{66}Zn(γ,γ') reported for a 3739.1 level. $T_{1/2}$: from (γ,γ') with $\Gamma_{\gamma0}/\Gamma$=0.75 *3* from adopted gammas.
3738.24 *4*	(4$^+$)		O	E(level): higher J^{π} member of a J^{π}=(2$^+$)+(4$^+$) level doublet reported in ^{64}Zn(t,p).
3747.03 *19*	5$^-$	46 ps *3*	CD GH JK p	XREF: Others: AB, AC Configuration=((π $p_{3/2}$)(π $g_{9/2}$))5$^-$ J^{π}: 5 from $\gamma(\theta)$ in ^{64}Ni(α,2pnγ); π from E2 to 3$^-$. $T_{1/2}$: by recoil distance in ^{55}Mn(^{14}N,npγ). DSA measurements of 0.8 ps +*11*−*4* from ^{63}Cu(α,pγ) and 6 ps +*14*−*3* from ^{64}Ni(α,2nγ) do not take fully into account strong feeding from the 4252 ($T_{1/2}$=133 ps *11*) and 4076 ($T_{1/2}$=29.8 ps *14*) levels. Other: 0.21 ps +*14*−*7* from (n,n′γ).
3753.01 *4*	4$^+$		B D FGH K p	J^{π}: L(p,p′)=4.
3770 *30*	(1$^-$)		QR W	J^{π}: from L(^{6}Li,d)=(1).
3791.123 *3*	1$^+$		B D FGH K m V	J^{π}: 1$^+$ from log *ft*=5.00 *4* from 0$^+$.
3806.4 *10*			D K m	
3825.0 *3*	0$^+$		B DEF K	J^{π}: from $\gamma(\theta)$ in (γ,γ').
3874 *5*			D K	
3882.424 *10*	(2)$^+$		B DE G K	J^{π}: from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
3898.3 *6*	5$^-$		CD G K O q X	
3924.71 *20*			D FGH K q	J^{π}: 6$^+$ from L(p,p′)=6; γ′s to 0$^+$ and 2$^+$ levels rule it out; level could be a doublet.
3946 *2*	(1$^-$)		D K pqR	J^{π}: L(p,p′)=(1).
3969 *2*	(4$^+$)		D K m Op	
4005 *10*	4$^+$		D m	J^{π}: L(p,p′)=4.
4011.7			E m V	E(level): from ^{66}Zn(γ,γ').
4019.2 *15*	2$^+$		D FG K m O	
4075.7 *3*	(6$^-$)	29.8 ps *14*	C E J L	XREF: Others: AC μ=0.9 *2*; Q=−0.081 *13* (2005St24) μ: By recoil into gas and or vacuum (RIGV) (1983Ba69). Q: From electron scattering (Es); recalculated

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
				value (1981Ko06). $T_{1/2}$: by recoil distance in ^{55}Mn(^{14}N,2pnγ). Other: >1.4 ps from (α,pγ). J^{π}: (6) from $\gamma(\theta)$, γ yields and decay systematics in ^{64}Ni(α,2nγ); π from (M1) to 5^-.
4081.0 *15*			D F K m	
4085.983 *4*	1^+		B D FGH K m V	J^{π}: log *ft*=5.99 *4* from 0^+.
4108.5 *10*			d F m R	π=+ from L(p,d)=1 for a level at 4100 *30*; π=− from L(p,p′)=3 for a level at 4110 *10*, indicating a possible doublet.
4119.0 *5*	(1^-)		d G K O q	
4182.7 *5*	(6^+)	0.15 ps *6*	CD JK	XREF: Others: AC J^{π}: (6) from $\gamma(\theta)$ and γ yields in ^{64}Ni(α,2nγ); π from (E2) to 4^+. L(p,p′)=4 at 4189 *7*. $T_{1/2}$: unweighted mean of DSA measurements 0.08 ps *+6−4* in ^{63}Cu(α,pγ) and 0.21 ps *+10−3* in ^{64}Ni(α,2nγ).
4186 *7*	(3^-)		K O	E(level): weighted average of 4184 *10* in (t,p) and 4188 *10* in (p,α).
4223 *2*	(1^-)		D K	XREF: Others: AB J^{π}: L(p,p′)=(1).
4251.9 *3*	(7^-)	133 ps *10*	C J Op	XREF: Others: AA μ=1.0 *2* (2005St24,1989Ra17) Configuration=((ν $F_{5/2}$)(ν $G_{9/2}$)$_{7-}$+(ν $P_{1/2}$)(ν $G_{9/2}$)$_{5-}$) E(level): unresolved doublet in (α,^{2}He) at 4220 *50*; L=7 assigned to the main level at 4220 with a tentative L=5 assigned to the 4400 level visible at some backward angles. μ: From recoil into gas and/or vacuum (RIGV) (1981Ko06). J^{π}: (7) from $\gamma(\theta)$ and γ yields in ^{64}Ni(α,2nγ); π from (E2) to 5^-. $T_{1/2}$: by recoil distance in ^{55}Mn(^{14}N,2pnγ). Other: >0.55 ps in (α,pγ).
4258 *2*			D K p	
4267 *7*	4^+		D K p	J^{π}: L(p,p′)=4.
4295.339 *4*	1^+	4.2 fs *+18−9*	B DE K m	J^{π}: 1^+ from log *ft*=5.23 *4* from 0^+ in ε decay.
4321.83 *20*			D H K m	
4332 *7*	2^+		D K O	J^{π}: L(t,p)=2.
4393.7 *16*	3^-	0.07 ps *+4−2*	D K OPQ T	$T_{1/2}$: from DSA in ^{66}Zn(α,$\alpha'\gamma$).
4424 *6*	1	7.0 fs *12*	DE H m	J^{π}: 1 from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
4433 *6*	1^-		D H m O	
4439 *7*	2^+		D m	J^{π}: L(p,p′)=2.
4454 *5*			D m	
4461.409 *5*	1^+	7 fs *+12−3*	B DE H m	J^{π}: 1^+ from log *ft*=5.54 *4* from 0^+ in ε decay.
4472 *7*	3^-		D m q	J^{π}: L(p,p′)=3.
4497.6 *5*			D H p	
4511[&] *5*	0^+		D Opq	
4511[&] *5*	(2^+)		D Opq	
4527 *5*			D pq	
4538 *7*	4^+		D pq	J^{π}: L(p,p′)=4.
4565 *2*	3^-		D q	J^{π}: L(p,p′)=3.
4567 *10*	5^-		O q	
4609? *2*	(1)	8.4 fs *+33−18*	E p	J^{π}: from $\gamma(\theta)$ in ^{66}Zn(γ,γ').

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
4610 *5*	4^+		D p	J^π: L(p,p′)=4.
4622 *6*			D H Op	
4635.3 *11*	(2)		DE	XREF: Others: AA J^π: (2) from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
4638.24 *14*	1		B	XREF: Others: AA J^π: log *ft*=7.96 *11* from 0^+; γ to 0^+.
4645 *10*			D	XREF: Others: AA
4655 *7*	$(3^-,4^+)$		D	XREF: Others: AA J^π: L(p,p′)=3+4; probable doublet.
4675.6 *5*	1^+		B l	XREF: Others: AA J^π: log *ft*=8.35 *15* from 0^+ rules out 0^+ to 0^+ transition; γ to 2^+.
4680 *50*				XREF: Others: AA
4683 *10*	(1)	7.1 fs *+24−14*	DE l	XREF: Others: AA J^π: (1) from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
4694 *7*	4^+		D l	XREF: Others: AA J^π: L(p,p′)=4.
4730 *7*	2^+		D l	XREF: Others: AA J^π: L(p,p′)=2.
4745 *10*			D l	
4758 *10*			D l q	
4780 *7*	5^-		D q	J^π: L(p,p′)=5.
4796 *7*	(1^-)		D q	J^π: L(p,p′)=(1).
4806.199 *5*	1^+	3.8 fs *+13−8*	B DE H	J^π: 1^+ from log *ft*=4.89 *4* from 0^+ in ε decay.
4814.1 *4*	(7^-)	0.6[a] ps *4*	C J	XREF: Others: AB J^π: (7) from $\gamma(\theta)$ and γ yields in ^{64}Ni(α,2nγ); π from (M1) to (6^-).
4832 *10*			D	
4849.93 *3*	1^+		B D	J^π: log *ft*=6.62 *6* from 0^+ rules out a 0^+ to 0^+ transition; γ to 2^+.
4866.056 *16*	1^+		B D	J^π: log *ft*=6.42 *6* from 0^+; γ to 0^+.
4875 *10*			D	
4885 *10*			D q	
4907 *10*			D q	
4918 *10*			D q	
4945 *10*			D	
4958.2 *4*	1^+		B D l	J^π: log *ft*=7.48 *11* from 0^+ rules out a 0^+ to 0^+ transition; γ to 2^+.
4984 *10*			D lm	
5005.8 *3*	1^+		B D lm	J^π: log *ft*=7.47 *7* from 0^+; γ to 0^+.
5025 *10*			D lm	
5038 *10*			D	
5059 *10*			D q	
5073 *10*			D q	
5086 *10*			D q	
5097 *10*			D q	
5106 *10*			D q	
5111.9 *4*	(8^-)		CD q	J^π: from $\gamma(\theta)$ and γ decay systematics in ^{64}Ni(α,2nγ).
5124 *10*			D q	
5143 *10*			D q	
5159 *10*			D	XREF: Others: AA
5169 *10*			D	XREF: Others: AA
5180 *10*			D	XREF: Others: AA
5198 *10*			D	XREF: Others: AA
5207.3 *5*	(8^+)	>6 ps	C	XREF: Others: AA, AB

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
				Configuration=(ν $g_{9/2}8^+$) configuration from (^{12}C,^{10}Be), (^{12}C,^{10}C) reaction where this level is seen strongly excited (1990Bo27). This level was seen weakly excited in the (α,^{2}He) reaction (1990Fi07). Jπ: (8) from $\gamma(\theta)$, γ yields and decay systematics in ^{64}Ni(α,2nγ); π from (E2) to (6)$^+$. $T_{1/2}$: by DSA in ^{64}Ni(α,2nγ).
5222 *10*			D	XREF: Others: AA
5234 *10*			D	XREF: Others: AA
5245 *10*			D	XREF: Others: AA
5263 *10*			D	
5274 *10*			D	
5285 *10*			D	
5305 *10*			D	
5322 *10*			D	
5331 *10*			D q	
5352 *10*			D q	
5364 *10*			D q	
5375 *10*			D q	
5389 *10*			D q	
5403 *10*			D q	XREF: Others: AB
5420 *10*			D	
5431 *10*			D	
5446 *10*			D	
5464.4 *5*	(9^-)	1.9 ps *8*	C q	Jπ: (9) from $\gamma(\theta)$ in ^{64}Ni(α,2nγ); π from (E2) to (7^-). $T_{1/2}$: by recoil distance in ^{55}Mn(^{14}N,2npγ). $T_{1/2}$=2.8 ps *+21−14* by DSA in ^{64}Ni(α,2nγ).
5500 *45*			q	
5650 *30*	3^-		D q	XREF: Others: AB E(level): from ^{66}Zn(p,p′). Jπ: L(p,p′)=3.
5740 *50*			A J q	
6000 *50*				XREF: Others: AB
6292.6 *6*	(10^+)	1.6 ps *+7−3*	C J	Jπ: (10) from $\gamma(\theta)$ in ^{64}Ni(α,2nγ); π from (E2) to (8^+). $T_{1/2}$: by DSA in ^{64}Ni(α,2nγ).
6419.0 *8*			C	
6850 *50*	(8^+)			XREF: Others: AB Configuration=(π $g_{9/2}8^+$) Jπ: from DWBA analysis of (^{12}C,^{10}Be), (^{12}C,^{10}C) data.
7.17×10^3 *18*			J	
7367.4 *4*	1	1.47 fs *16*	E	Jπ: from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
7517.3 *10*		1.5 ps *+6−3*	C	$T_{1/2}$: by DSA in ^{64}Ni(α,2nγ).
7550 *50*	(6^+)			XREF: Others: AB Configuration=((π $g_{9/2}$)(π $d_{5/2}$))6^+ Jπ: from DWBA analysis of (^{12}C,^{10}Be), (^{12}C,^{10}C) data.
7693.3 *3*	1	2.2 fs *4*	E	Jπ: 1 from $\gamma(\theta)$ in ^{66}Zn(γ,γ').
11059.9 *10*	2^-,3^-		I	Jπ: from n(θ) in ^{65}Cu(p,n) IAR.
11395 *10*			I	
11411 *10*			I	
11457 *10*			I	

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Adopted Levels, Gammas (continued)

^{66}Zn Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
11514 *10*		I	
11593 *10*		I	
11654 *10*		I	
11698 *10*		I	
11757 *10*		I	
11841 *10*	(2$^+$)	I	J$^{\pi}$: from n(θ) and γ(θ) in ^{65}Cu(p,n),(p,nγ) IAR.
11916 *10*		I	
12194? *10*		I	
12218 *10*		I	
12293 *10*		I	
12324 *10*		I	
12401 *10*		I	
12433? *10*		I	
12552 *10*		I	
12602 *10*		I	
12651 *10*		I	
12688 *10*		I	
12714 *10*		I	

† Except as noted, levels with E<10000 are as follows: 1) from a least-squares fit to adopted Eγ data; 2) energies with ΔE=2-10 are from ^{66}Zn(p,p′); 3) energies with ΔE>10 are from ^{66}Zn(α,α′). Levels with E>10000 are from ^{65}Cu(p,n),(p,nγ) IAR.

‡ Except as noted, $T_{1/2}$ is from measured widths in ^{66}Zn(γ,γ′) and adopted γ branchings.

\# From L-transfer in ^{64}Zn(t,p), except as noted.

@ Consistent with angular distribution and analyzing-power data in (pol p,p′) (1993Mo15).

& Doublet reported in ^{64}Zn(t,p). E=4511 *5* given for one level in ^{66}Zn(p,p′).

a By DSA from ^{63}Cu(α,pγ).

γ(^{66}Zn)

E$_i$(level)	J$^\pi_i$	E$_\gamma$[‡]	I$_\gamma$[#]	E$_f$	J$^\pi_f$	Mult.	δ[a]	α[†]	I$_{(\gamma+ce)}$	Comments
1039.2279	2$^+$	1039.220 *3*	100.0 *3*	0.0	0$^+$	E2[@]		0.000269 *4*		α(K)=0.000241 *4*; α(L)=2.41×10^{-5} *4*; α(M)=3.46×10^{-6} *5*; α(N+..)=1.384×10^{-7} *20* α(N)=1.384×10^{-7} *20* B(E2)(W.u.)=17.5 *4*
1872.7653	2$^+$	833.5324 *21*	100.0 *4*	1039.2279	2$^+$	M1+E2	−1.6 *2*	0.000434 *9*		α(K)=0.000389 *8*; α(L)=3.91×10^{-5} *8*; α(M)=5.60×10^{-6} *11*; α(N+..)=2.24×10^{-7} *5* α(N)=2.24×10^{-7} *5* B(M1)(W.u.)=0.056 *23*; B(E2)(W.u.)=3.3×10^2 *13* Mult.: D+Q from $\gamma(\theta)$ in ^{66}Cu β^- decay; M1+E2 from RUL. δ: From $\gamma\gamma(\theta)$ in ^{66}Ga ε DECAY (2002Ga20). Other value: −1.9 *3*, as given by 1974Kr16 from analysis of 1969Ha46 data.
		1872.740 *6*	0.39 *3*	0.0	0$^+$	[E2]		0.000328 *5*		α(K)=7.04×10^{-5} *10*; α(L)=6.99×10^{-6} *10*; α(M)=1.001×10^{-6} *14*; α(N+..)=0.000250 *4* α(N)=4.05×10^{-8} *6*; α(IPF)=0.000250 *4* B(E2)(W.u.)=0.032 *12*
2372.353	0$^+$	499.590 *6*	0.41 *10*	1872.7653	2$^+$	E2		0.00199 *3*		α(K)=0.001782 *25*; α(L)=0.000182 *3*; α(M)=2.61×10^{-5} *4*; α(N+..)=1.013×10^{-6} *15* α(N)=1.013×10^{-6} *15* B(E2)(W.u.)<22
		1333.112 *5*	100.0 *4*	1039.2279	2$^+$	E2		0.000190 *3*		B(E2)(W.u.)<40 α(K)=0.0001383 *20*; α(L)=1.379×10^{-5} *20*; α(M)=1.98×10^{-6} *3*; α(N+..)=3.61×10^{-5} *5* α(N)=7.96×10^{-8} *12*; α(IPF)=3.61×10^{-5} *5* Mult.: Q from $\gamma(\theta)$ in ^{66}Zn(p,p′γ); E2 from RUL.
		2372.375[d]		0.0	0$^+$	E0			6.6×10^{-3} *13*	E$_\gamma$: from level energy difference; 2372.2 from (p,p′γ). Mult.: from internal conversion data and absence of γ ray in (p,p′γ). I$_{(\gamma+ce)}$: for 100 transitions of 1333γ from (p,p′γ).
2451.01	4$^+$	1411.75[b] *5*	100[f]	1039.2279	2$^+$	E2[@]		0.000194 *3*		α(K)=0.0001227 *18*; α(L)=1.222×10^{-5} *18*; α(M)=1.751×10^{-6} *25* α(N)=7.06×10^{-8} *10*; α(IPF)=5.69×10^{-5} *8* B(E2)(W.u.)=18 *3* δ(M3/E2)=+0.04 *4*.
		2450[d] *2*	2[f]	0.0	0$^+$					E$_\gamma$: not confirmed by any other ^{66}Zn data.
2703.6	(3)	830.7[c] *8*	100[g] *11*	1872.7653	2$^+$					

$^{66}_{30}$Zn$_{36}$-8

Adopted Levels, Gammas (continued)

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

E_i(level)	J^{π}_i	E_{γ}[‡]	I_{γ}[#]	E_f	J^{π}_f	Mult.	δ[a]	α[†]	Comments
2703.6	(3)	1664.4[b] *4*	7.1[g] *10*	1039.2279	2^+	(D+Q)	8.5 *15*		Mult.,δ: from $\gamma(\theta)$ in $^{66}Zn(n,n'\gamma)$.
2762.8	(2)	2762	100	0.0	0^+				E_{γ}: reported only in $^{66}Zn(\gamma,\gamma')$.
2765.56	4^+	314.6[b] *1*	36[b] *2*	2451.01	4^+				
		892.7[b] *1*	100[b] *3*	1872.7653	2^+	E2[@]		0.000388 *6*	B(E2)(W.u.)<4.0 α(K)=0.000348 *5*; α(L)=3.50×10^{-5} *5*; α(M)=5.01×10^{-6} *7*; α(N+..)=2.00×10^{-7} *3* α(N)=2.00×10^{-7} *3* δ(M3/E2)=−0.04 *6*.
		1726.4[b] *2*	87[b] *3*	1039.2279	2^+	E2[@]		0.000274 *4*	B(E2)(W.u.)<0.13 α(K)=8.21×10^{-5} *12*; α(L)=8.16×10^{-6} *12*; α(M)=1.169×10^{-6} *17*; α(N+..)=0.000183 *3* α(N)=4.73×10^{-8} *7*; α(IPF)=0.000183 *3* δ(M3/E2)=+0.00 *3*.
2780.157	2^+	328.8[b] *5*	11[b] *3*	2451.01	4^+				
		907.394 *19*	17.7 *12*	1872.7653	2^+				
		1740.904 *16*	23.1 *3*	1039.2279	2^+	M1+E2	0.33 *28*	0.000241 *8*	α(K)=7.74×10^{-5} *13*; α(L)=7.67×10^{-6} *13*; α(M)=1.100×10^{-6} *19*; α(N+..)=0.000155 *7* α(N)=4.47×10^{-8} *8*; α(IPF)=0.000155 *7* B(M1)(W.u.)=0.0022 *7*; B(E2)(W.u.)=0.13 *+20−13*
		2780.095 *16*	100.0 *24*	0.0	0^+	E2		0.000722 *11*	α(K)=3.51×10^{-5} *5*; α(L)=3.47×10^{-6} *5*; α(M)=4.98×10^{-7} *7*; α(N+..)=0.000683 *10* α(N)=2.02×10^{-8} *3*; α(IPF)=0.000683 *10* B(E2)(W.u.)=0.54 *15* Mult.: Q from $\gamma(\theta)$ in $^{66}Zn(n,n'\gamma)$; E2 from RUL.
2826.69	3^-	953.93 *9*	11.3[g] *13*	1872.7653	2^+				
		1787.44 *9*	100[g] *9*	1039.2279	2^+	(E1)[&]		0.000526 *8*	α(K)=4.21×10^{-5} *6*; α(L)=4.16×10^{-6} *6*; α(M)=5.95×10^{-7} *9*; α(N+..)=0.000479 *7* α(N)=2.41×10^{-8} *4*; α(IPF)=0.000479 *7* B(E1)(W.u.)=0.00036 *5* δ(M2/E1)=−0.04 *5*.
2938.074	2^+	1065.305 *9*	0.60 *12*	1872.7653	2^+				
		1898.823 *8*	100.0 *8*	1039.2279	2^+	(M1+E2)	0.03 *1*	0.000288 *4*	α(K)=6.58×10^{-5} *10*; α(L)=6.52×10^{-6} *10*; α(M)=9.35×10^{-7} *13*; α(N+..)=0.000215 *3* α(N)=3.80×10^{-8} *6*; α(IPF)=0.000215 *3* B(M1)(W.u.)=(0.043 *17*); B(E2)(W.u.)=(0.017 *14*) Mult.: D+Q from $\gamma(\theta)$ in $^{66}Zn(n,n'\gamma)$; M1+E2 from ΔJ^{π}. δ: from $\gamma(\theta)$ in (n,n′γ); sign convention not specified.
		2941[h]	71 *24*	0.0	0^+				$E\gamma$,$I\gamma$: reported only in $^{66}Zn(\gamma,\gamma')$.
3077.73	4^+	312.0[c] *8*	10[c] *3*	2765.56	4^+				E_{γ}: doublet. $E\gamma$ is from level energy difference in

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.	δ[a]	α[†]	$I_{(\gamma+ce)}$	Comments
										$^{64}Ni(\alpha,2n\gamma)$. $E\gamma$=312.8 from level energy difference in $^{65}Cu(p,\gamma)$.
3077.73	4^+	627.6[c] *4*	100[c] *10*	2451.01	4^+	(M1+E2)[&]	−0.25 *12*	0.000688 *23*		α(K)=0.000617 *21*; α(L)=6.19×10^{-5} *21*; α(M)=8.9×10^{-6} *3*; α(N+..)=3.57×10^{-7} *12* α(N)=3.57×10^{-7} *12* B(M1)(W.u.)=(0.056 *9*); B(E2)(W.u.)=(15 *14*)
		1204.2[c] *5*	33[c] *6*	1872.7653	2^+	(E2)[&]		0.000201 *3*		α(K)=0.0001723 *25*; α(L)=1.721×10^{-5} *25*; α(M)=2.47×10^{-6} *4*; α(N+..)=9.43×10^{-6} *1* α(N)=9.91×10^{-8} *14*; α(IPF)=9.33×10^{-6} *15* B(E2)(W.u.)=3.1 *7* δ(M3/E2)=−0.15 *15*.
3105.040	0^+	1232.264 *8*	100 *4*	1872.7653	2^+					
		2065.778 *7*	6.2 *3*	1039.2279	2^+					
		3105.064		0.0	0^+	E0			2.4×10^{-2} *5*	E_γ: from level energy difference; 3107.0 from (p,p′γ). Mult.: from internal conversion data and absence of γ ray in (p,p′γ). $I_{(\gamma+ce)}$: for 100 transitions of 1234γ from (p,p′γ).
3212.582	2^+	2173.319 *15*	100 *6*	1039.2279	2^+					E_γ: placed as depopulating the 3213 level in $^{65}Cu(p,\gamma)$, $^{66}Zn(p,p'\gamma)$, $^{66}Zn(n,n'\gamma)$ and by 1971Ca14, 1994En02 in ^{66}Ga ε decay. Placed as depopulating a proposed level at 4047 by 1970Ph01 in ε decay, which level, however, is not observed by 1994En02.
		3212.499 *19*	2.2 *5*	0.0	0^+					
3228.885	1^+	290.8105 *11*	0.92 *3*	2938.074	2^+					
		448.73 *2*	2.01 *7*	2780.157	2^+	M1+E2	−0.02 *3*	0.001419 *20*		α(K)=0.001272 *18*; α(L)=0.0001283 *19*; α(M)=1.84×10^{-5} *3*; α(N+..)=7.39×10^{-7} α(N)=7.39×10^{-7} *11*
		856.527 *10*	2.09 *12*	2372.353	0^+					
		1356.104 *9*	6.7 *7*	1872.7653	2^+					
		2189.616 *6*	100.0 *5*	1039.2279	2^+	M1+E2	0.12 *2*	0.000398 *6*		α(K)=5.12×10^{-5} *8*; α(L)=5.07×10^{-6} *7*; α(M)=7.26×10^{-7} *11*; α(N+..)=0.000341 *5* α(N)=2.95×10^{-8} *5*; α(IPF)=0.000341 *5* B(M1)(W.u.)=0.012 *3*; B(E2)(W.u.)=0.060 *25* Mult.: from ce measurement in ε decay.
		3228.800 *6*	28.3 *2*	0.0	0^+	M1		0.000812 *12*		α(K)=2.68×10^{-5} *4*; α(L)=2.64×10^{-6} *4*; α(M)=3.79×10^{-7} *6*; α(N+..)=0.000782 *11*

From ENSDF

$^{66}_{30}Zn_{36}$-10

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

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Mult.	δ[a]	α[†]	Comments
									α(K)=2.68×10^{-5} *4*; α(L)=2.64×10^{-6} *4*; α(M)=3.79×10^{-7} *6*; α(N+..)=0.000782 *11* α(N)=1.544×10^{-8} *22*; α(IPF)=0.000782 *11* B(M1)(W.u.)=0.0011 *3*
3331.441	2^+	551.284 *22*	7.2 *7*	2780.157	2^+				
		1458.662 *12*	100.0 *23*	1872.7653	2^+	(M1+E2)	−0.01 *9*	0.0001741 *25*	α(K)=0.0001070 *15*; α(L)=1.062×10^{-5} *15*; α(M)=1.523×10^{-6} *22* α(N)=6.18×10^{-8} *9*; α(IPF)=5.49×10^{-5} *8* B(M1)(W.u.)=(0.058 *+10−15*)
		2292.171 *13*	17.6 *12*	1039.2279	2^+				
		3331.351 *14*	23 *3*	0.0	0^+				
3380.944	1^-	442.873 *14*	1.06 *8*	2938.074	2^+				
		600.788 *21*	0.92 *6*	2780.157	2^+				
		1008.588 *12*	4.0 *5*	2372.353	0^+				
		1508.158 *7*	37.8 *2*	1872.7653	2^+				
		2341.673 *11*	0.22 *5*	1039.2279	2^+				
		3380.850 *6*	100.0 *6*	0.0	0^+				
3427.406	$1,2^-$	1554.62 *3*	100	1872.7653	2^+				
3432.408	1^-	494.336 *1*	32.0 *3*	2938.074	2^+				
		1060.051 *1*	15.4 *4*	2372.353	0^+				
		1559.627 *1*	7.6 *6*	1872.7653	2^+				
		2393.129 *7*	82 *3*	1039.2279	2^+	E1		0.000924 *13*	α(K)=2.73×10^{-5} *4*; α(L)=2.70×10^{-6} *4*; α(M)=3.86×10^{-7} *6*; α(N+..)=0.000894 *13* α(N)=1.569×10^{-8} *22*; α(IPF)=0.000894 *13* B(E1)(W.u.)=0.00035 *+10−23*
		3432.309 *7*	100.0 *13*	0.0	0^+				
3507.249	2^+	680.56 *10*	18 *5*	2826.69	3^-				
		1634.46 *7*	42 *7*	1872.7653	2^+				
		2467.97 *7*	100 *9*	1039.2279	2^+				
3523.6		758.0[c] *8*	100	2765.56	4^+				
3531.692	0^+	2492.42 *3*	100	1039.2279	2^+				
3576.370	4^+	749.68 *10*	25 *8*	2826.69	3^-				
		796.21 *5*	53 *12*	2780.157	2^+				
		1703.59 *5*	100 *4*	1872.7653	2^+				
		2537.09 *5*	93 *20*	1039.2279	2^+				
3670.72	2^+	441.822	100 *9*	3228.885	1^+				E_γ: from level energy difference; 440.5 *1* from (n,n′γ). I_γ: from (n,n′γ).
		1219.1[b] *2*	39[b] *7*	2451.01	4^+				
		1797.94 *9*	18 *5*	1872.7653	2^+				
		2631.44 *9*	28 *11*	1039.2279	2^+				

From ENSDF

$^{66}_{30}Zn_{36}$-11

Adopted Levels, Gammas (continued)

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

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Mult.	δ[a]	α[†]	Comments
3689.01	$1^+,2^+,3^+$	1815.4[h] *5*	100	1872.7653	2^+				E_γ: reported only in $^{65}Cu(p,\gamma)$.
3709.4	(5)	943.8[c] *3*	100[c]	2765.56	4^+	(D+Q)[&]	−1.5 *+2−1*		
3725.3		293.0[d] *5*	11[f]	3432.408	1^-				
		962[d] *1*	100[f]	2765.56	4^+				
3731.6		966.0[e] *5*	100[g]	2765.56	4^+				E_γ: reported only in $^{65}Cu(p,\gamma)$.
3738.207	+	800.13 *5*	7 *4*	2938.074	2^+				
		2698.92 *5*	27 *5*	1039.2279	2^+				
		3738.10 *5*	100 *6*	0.0	0^+				
3747.03	5^-	669.5[c] *3*	21[c] *2*	3077.73	4^+	(E1)[&]		0.000294 *5*	$\alpha(K)=0.000264$ *4*; $\alpha(L)=2.63\times10^{-5}$ *4*; $\alpha(M)=3.77\times10^{-6}$ *6*; $\alpha(N+..)=1.511\times10^{-7}$ *22* $\alpha(N)=1.511\times10^{-7}$ *22* B(E1)(W.u.)=4.9×10^{-6} *7* δ(M2/E1)=−0.04 *6*.
		919.9[c] *3*	4.9[c] *5*	2826.69	3^-	E2[@]		0.000360 *5*	$\alpha(K)=0.000323$ *5*; $\alpha(L)=3.24\times10^{-5}$ *5*; $\alpha(M)=4.65\times10^{-6}$ *7*; $\alpha(N+..)=1.85\times10^{-7}$ *3* $\alpha(N)=1.85\times10^{-7}$ *3* B(E2)(W.u.)=0.045 *7* δ(M3/E2)=−0.00 *6*.
		981.5[c] *5*	<6[c]	2765.56	4^+				
		1295.6[c] *4*	100[c] *10*	2451.01	4^+	(E1+M2)[&]	−0.04 *2*	0.000193 *3*	$\alpha(K)=7.15\times10^{-5}$ *11*; $\alpha(L)=7.09\times10^{-6}$ *11*; $\alpha(M)=1.015\times10^{-6}$ *16*; $\alpha(N+..)=0.0001134$ $\alpha(N)=4.10\times10^{-8}$ *7*; $\alpha(IPF)=0.0001134$ *17* B(E1)(W.u.)=(3.2×10^{-6} *5*); B(M2)(W.u.)=(0.014 *+15−14*)
3753.01	4^+	2713.73 *5*	100	1039.2279	2^+				
3791.123	1^+	283.87 *3*	0.016 *4*	3507.249	2^+				
		410.178 *12*	0.289 *12*	3380.944	1^-				
		459.683 *14*	0.387 *17*	3331.441	2^+				
		562.241 *10*	0.029 *3*	3228.885	1^+				
		578.540 *19*	0.26 *4*	3212.582	2^+				
		686.080 *6*	1.11 *4*	3105.040	0^+				
		853.038 *8*	0.334 *9*	2938.074	2^+	M1+E2	0.37 *18*	0.000357 *11*	$\alpha(K)=0.000321$ *10*; $\alpha(L)=3.20\times10^{-5}$ *11*; $\alpha(M)=4.59\times10^{-6}$ *15*; $\alpha(N+..)=1.85\times10^{-7}$ *6* $\alpha(N)=1.85\times10^{-7}$ *6*
		1010.957 *19*	0.119 *7*	2780.157	2^+				
		1418.754 *5*	2.703 *13*	2372.353	0^+				
		1918.329 *5*	8.76 *4*	1872.7653	2^+	M1+E2	−0.07 *3*	0.000295 *5*	$\alpha(K)=6.47\times10^{-5}$ *9*; $\alpha(L)=6.40\times10^{-6}$ *9*; $\alpha(M)=9.18\times10^{-7}$ *13*; $\alpha(N+..)=0.000223$ *4* $\alpha(N)=3.73\times10^{-8}$ *6*; $\alpha(IPF)=0.000223$ *4*

$^{66}_{30}Zn_{36}$-12

Adopted Levels, Gammas (continued)

γ(^{66}Zn) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Mult.	δ[a]	α[†]	Comments
3791.123	1^+	2751.835 5	100.0 5	1039.2279	2^+	(M1+E2)	−0.12 2	0.000626 9	α(K)=3.48×10^{-5} 5; α(L)=3.43×10^{-6} 5; α(M)=4.92×10^{-7} 7; α(N+..)=0.000588 9 α(N)=2.00×10^{-8} 3; α(IPF)=0.000588 9
		3791.004 8	2.941 24	0.0	0^+	M1		0.001017 15	α(K)=2.08×10^{-5} 3; α(L)=2.05×10^{-6} 3; α(M)=2.95×10^{-7} 5; α(N+..)=0.000994 14 α(N)=1.200×10^{-8} 17; α(IPF)=0.000994 14
3825.0	0^+	2785.7 3	100	1039.2279	2^+				
3882.424	$(2)^+$	1507[h]		2372.353	0^+				Eγ,Iγ: reported only in ^{66}Zn(γ,γ′).
		2009.628 16	100 21	1872.7653	2^+				
		2843.130 16	54 11	1039.2279	2^+				
3898.3	5^-	1071.3[c] 7	100[c]	2826.69	3^-	(E2(+M3))[&]	−0.04 20	0.00025 4	α(K)=0.00023 4; α(L)=2.3×10^{-5} 4; α(M)=3.2×10^{-6} 6; α(N+..)=1.30×10^{-7} 21 α(N)=1.30×10^{-7} 21
3924.71		1555[d] 1	100[f]	2372.353	0^+				E_γ: possible doublet. Eγ=1553.0 in ^{65}Cu(p,γ). I_γ: Iγ(1555)/Iγ(2888)<0.6 from ^{65}Cu(p,γ).
		2885.3[b] 2	33	1039.2279	2^+				I_γ: relative branching from ^{66}Zn(p,p′γ).
4019.2	2^+	1239.0[d] 15	100[f]	2780.157	2^+				
4075.7	(6^-)	328.6[c] 2	100[c]	3747.03	5^-	(M1+E2)[@]	+0.10 2	0.00299 5	α(K)=0.00268 5; α(L)=0.000272 5; α(M)=3.91×10^{-5} 7; α(N+..)=1.559×10^{-6} 25 α(N)=1.559×10^{-6} 25 B(M1)(W.u.)=(0.0206 10); B(E2)(W.u.)=(3.1 13)
4085.983	1^+	347.77 5	0.14 5	3738.207	+				
		554.28 3	0.35 4	3531.692	0^+				
		653.568 14	0.10 4	3432.408	1^-				
		658.57 3	0.59 6	3427.406	$1,2^-$				
		705.031 15	0.30 4	3380.944	1^-				
		857.093 9	1.2 4	3228.885	1^+				
		873.392 21	1.34 9	3212.582	2^+				
		980.934 13	3.80 15	3105.040	0^+				
		1147.896 10	6.15 21	2938.074	2^+	M1+E2	−0.18 5	0.000192 3	α(K)=0.0001708 25; α(L)=1.700×10^{-5} 25; α(M)=2.44×10^{-6} 4; α(N+..)=2.28×10^{-6} 4 α(N)=9.87×10^{-8} 14; α(IPF)=2.18×10^{-6} 4
		1305.807 21	0.31 4	2780.157	2^+				
		1713.602 12	1.92 9	2372.353	0^+				
		2213.181 9	10.3 4	1872.7653	2^+	M1+E2	−0.23 5	0.000410 6	α(K)=5.03×10^{-5} 7; α(L)=4.98×10^{-6} 7; α(M)=7.14×10^{-7} 10; α(N+..)=0.000354 6 α(N)=2.90×10^{-8} 4; α(IPF)=0.000354 6
		3046.684 9	4.47 18	1039.2279	2^+	M1+E2	−0.8 2	0.000778 16	α(K)=2.97×10^{-5} 5; α(L)=2.94×10^{-6} 5;

$^{66}_{30}$Zn$_{36}$-13

Adopted Levels, Gammas (continued)

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

E_i(level)	J^{π}_i	E_{γ}[‡]	I_{γ}[#]	E_f	J^{π}_f	Mult.	δ[a]	α[†]	Comments
									α(M)=4.21×10^{-7} *6*; α(N+..)=0.000745 *16* α(N)=1.712×10^{-8} *25*; α(IPF)=0.000745 *16*
4085.983	1$^+$	4085.853 *9*	100.0 *6*	0.0	0$^+$	M1		0.001117 *16*	α(K)=1.86×10^{-5} *3*; α(L)=1.83×10^{-6} *3*; α(M)=2.63×10^{-7} *4*; α(N+..)=0.001096 *16* α(N)=1.070×10^{-8} *15*; α(IPF)=0.001096 *16*
4119.0	(1$^-$)	3079.7[e] *5*	100[g]	1039.2279	2$^+$				E_{γ}: reported only in ^{65}Cu(p,γ).
4182.7	(6$^+$)	1732.9[c] *5*	100[c]	2451.01	4$^+$	(E2)[@]		0.000276 *4*	α(K)=8.15×10^{-5} *12*; α(L)=8.10×10^{-6} *12*; α(M)=1.161×10^{-6} *17*; α(N+..)=0.000186 *3* α(N)=4.69×10^{-8} *7*; α(IPF)=0.000186 *3* B(E2)(W.u.)=15 *6* δ(M3/E2)<5.3×10^{-4} from RUL. δ=−0.10 *5* from $\gamma(\theta)$ in (d,2nγ).
4251.9	(7$^-$)	175.9[c] *3*	87[c] *9*	4075.7	(6$^-$)	(M1+E2)[@]	+0.09 *2*	0.0144 *4*	α(K)=0.0128 *3*; α(L)=0.00133 *4*; α(M)=0.000190 *5*; α(N+..)=7.48×10^{-6} *17* α(N)=7.48×10^{-6} *17* B(M1)(W.u.)=(0.0139 *21*); B(E2)(W.u.)=(6 *3*)
		504.7[c] *3*	100[c] *10*	3747.03	5$^-$	(E2)[@]		0.00193 *3*	α(K)=0.001726 *25*; α(L)=0.0001766 *25*; α(M)=2.52×10^{-5} *4*; α(N+..)=9.82×10^{-7} *14* α(N)=9.82×10^{-7} *14* B(E2)(W.u.)=4.4 *7* δ(M3/E2)=−0.00 *2*.
4295.339	1$^+$	412.916 *16*	0.088 *13*	3882.424	(2)$^+$				
		557.13 *5*	0.161 *17*	3738.207	$^+$	M1+E2		0.0011 *3*	α(K)=0.00103 *25*; α(L)=0.00010 *3*; α(M)=1.5×10^{-5} *4*; α(N+..)=5.9×10^{-7} *14* α(N)=5.9×10^{-7} *14*
		718.97 *5*	0.260 *20*	3576.370	4$^+$				
		763.64 *3*	0.233 *20*	3531.692	0$^+$				
		862.926 *13*	0.398 *20*	3432.408	1$^-$				
		867.93 *3*	0.114 *14*	3427.406	1,2$^-$				
		914.388 *14*	0.71 *4*	3380.944	1$^-$				
		963.892 *15*	0.38 *3*	3331.441	2$^+$				
		1066.450 *12*	0.062 *12*	3228.885	1$^+$				
		1082.75 *2*	0.348 *20*	3212.582	2$^+$				
		1190.287 *7*	3.35 *19*	3105.040	0$^+$				
		1357.250 *12*	4.3 *13*	2938.074	2$^+$	M1+E2	−0.18 *5*	0.0001689 *24*	α(K)=0.0001231 *18*; α(L)=1.223×10^{-5} *18*; α(M)=1.753×10^{-6} *25* α(N)=7.11×10^{-8} *10*; α(IPF)=3.18×10^{-5} *5* B(M1)(W.u.)=0.054 *+20−29*; B(E2)(W.u.)=1.5 *+10−12*
		1515.162 *20*	0.162 *15*	2780.157	2$^+$				

From ENSDF

$^{66}_{30}Zn_{36}$-14

γ(^{66}Zn) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Mult.	δ[a]	α[†]	Comments
4295.339	1^+	2422.525 7	49.37 24	1872.7653	2^+	M1+E2	0.01 3	0.000491 7	α(K)=4.30×10^{-5} 6; α(L)=4.25×10^{-6} 6; α(M)=6.10×10^{-7} 9; α(N+..)=0.000443 7 α(N)=2.48×10^{-8} 4; α(IPF)=0.000443 7 B(M1)(W.u.)=0.112 +24−48; B(E2)(W.u.)=0.003 +19−3
		3256.021 9	2.47 10	1039.2279	2^+	M1+E2	1.5 2	0.000889 14	α(K)=2.70×10^{-5} 4; α(L)=2.66×10^{-6} 4; α(M)=3.81×10^{-7} 6; α(N+..)=0.000859 14 α(N)=1.552×10^{-8} 22; α(IPF)=0.000859 14 B(M1)(W.u.)=0.00071 +21−34; B(E2)(W.u.)=0.24 +6−11
		4295.187 10	100.0 8	0.0	0^+				
4321.83		3282.5[b] 2	100	1039.2279	2^+				
4393.7	3^-	1565.2 20	≈100	2826.69	3^-				Eγ: reported only in ^{66}Zn(α,α′γ). Iγ: from ^{66}Zn(α,α′γ).
		3357.0 25	≈100	1039.2279	2^+				Eγ: reported only in ^{66}Zn(α,α′γ). Iγ: from ^{66}Zn(α,α′γ).
4424	1	4424 6	100	0.0	0^+				Eγ: from ^{66}Zn(n,n′γ). Eγ=4426 in ^{66}Zn(γ,γ′). Iγ: from ^{66}Zn(n,n′γ).
4433	1^-	4433[h] 6	100	0.0	0^+				Eγ,Iγ: reported only in ^{66}Zn(n,n′γ).
4461.409	1^+	375.398 17	0.25 7	4085.983	1^+				
		670.251 14	0.48 8	3791.123	1^+				
		708.36 5	1.01 9	3753.01	4^+				
		723.17 5	0.40 6	3738.207	+				
		885.00 5	0.22 6	3576.370	4^+				
		929.68 3	0.53 7	3531.692	0^+				
		954.12 7	0.52 8	3507.249	2^+				
		1129.923 18	1.59 9	3331.441	2^+				
		1232.480 15	6.5 22	3228.885	1^+				
		1248.779 22	0.12 4	3212.582	2^+				
		1356.320 15	14.3 22	3105.040	0^+				
		1523.279 15	0.64 6	2938.074	2^+				
		2088.985 13	1.3 3	2372.353	0^+				
		2588.553 13	3.07 18	1872.7653	2^+	M1+E2	0.35 27	0.000568 16	α(K)=3.86×10^{-5} 6; α(L)=3.81×10^{-6} 6; α(M)=5.47×10^{-7} 9; α(N+..)=0.000525 16 α(N)=2.22×10^{-8} 4; α(IPF)=0.000525 16 B(M1)(W.u.)=0.0022 +10−22; B(E2)(W.u.)=0.06 +10−6
		3422.040 8	100.0 7	1039.2279	2^+	M1+E2	−0.06 2	0.000885 13	α(K)=2.44×10^{-5} 4; α(L)=2.41×10^{-6} 4; α(M)=3.46×10^{-7} 5; α(N+..)=0.000858 12 α(N)=1.408×10^{-8} 20; α(IPF)=0.000858 12 B(M1)(W.u.)=0.034 +15−34; B(E2)(W.u.)=0.017 +14−17
		4461.202 9	97.7 13	0.0	0^+				
4497.6		3458.3[b] 5	100	1039.2279	2^+				

Adopted Levels, Gammas (continued)

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

E_i(level)	J^{π}_i	E_γ[‡]	I_γ[#]	E_f	J^{π}_f	Mult.	δ[a]	α[†]	Comments
4609?	(1)	4609[h]	100	0.0	0^+				E_γ,I_γ: reported only in $^{66}Zn(\gamma,\gamma')$.
4622		4622 *6*	100	0.0	0^+				$E\gamma,I\gamma$: reported only in $^{66}Zn(n,n'\gamma)$.
4635.3	(2)	2762[h]	100	1872.7653	2^+				$E\gamma,I\gamma$: reported only in $^{66}Zn(\gamma,\gamma')$.
4638.24	1	1106.53 *24*	77 *24*	3531.692	0^+				
		1409.35 *24*	1.0×10^2 *5*	3228.885	1^+				
		2265.84 *24*	9×10^1 *4*	2372.353	0^+				
4675.6	1^+	2802.8 *5*	100	1872.7653	2^+				
4683	(1)	4685[h]	100	0.0	0^+				$E\gamma,I\gamma$: reported only in $^{66}Zn(\gamma,\gamma')$.
4806.199	1^+	1015.081 *18*	0.66 *16*	3791.123	1^+				
		1135.47 *9*	0.25 *5*	3670.72	2^+				
		1274.50 *3*	0.38 *3*	3531.692	0^+				
		1298.95 *7*	0.205 *24*	3507.249	2^+				
		1425.25 *2*	0.32 *3*	3380.944	1^-				
		1577.308 *20*	0.21 *4*	3228.885	1^+				
		1868.105 *20*	1.5 *3*	2938.074	2^+				
		2026.016 *25*	0.14 *4*	2780.157	2^+				
		2433.807 *18*	0.40 *4*	2372.353	0^+				
		2933.358 *9*	11.45 *16*	1872.7653	2^+	M1+E2	1.6 *2*	0.000762 *12*	$\alpha(K)=3.19\times10^{-5}$ *5*; $\alpha(L)=3.15\times10^{-6}$ *5*; $\alpha(M)=4.52\times10^{-7}$ *7*; $\alpha(N+..)=0.000727$ *12* $\alpha(N)=1.84\times10^{-8}$ *3*; $\alpha(IPF)=0.000727$ *12* B(M1)(W.u.)=0.0060 *+17−24*; B(E2)(W.u.)=2.9 *+7−10*
		3766.850 *9*	8.0 *3*	1039.2279	2^+	M1+E2	0.11 *4*	0.001009 *15*	$\alpha(K)=2.11\times10^{-5}$ *3*; $\alpha(L)=2.08\times10^{-6}$ *3*; $\alpha(M)=2.98\times10^{-7}$ *5*; $\alpha(N+..)=0.000986$ *14* $\alpha(N)=1.212\times10^{-8}$ *17*; $\alpha(IPF)=0.000986$ *14* B(M1)(W.u.)=0.0069 *+15−24*; B(E2)(W.u.)=0.010 *8*
		4806.007 *9*	100.0 *6*	0.0	0^+				E_γ: γ-ray, in ^{66}Ga decay, often used for the efficiency calibration of germanium detectors.
4814.1	(7^-)	738.4[c] *3*	100[c] *9*	4075.7	(6^-)	(M1+E2)[@]	+0.11 *2*	0.000472 *7*	$\alpha(K)=0.000423$ *6*; $\alpha(L)=4.24\times10^{-5}$ *6*; $\alpha(M)=6.08\times10^{-6}$ *9*; $\alpha(N+..)=2.45\times10^{-7}$ *4* $\alpha(N)=2.45\times10^{-7}$ *4* B(M1)(W.u.)=(0.06 *5*); B(E2)(W.u.)=(2.2 *18*)
		915.5[c] *8*	45[c] *9*	3898.3	5^-				
4849.93	1^+	1468.97 *5*	6.0 *17*	3380.944	1^-				
		2977.08 *4*	100 *10*	1872.7653	2^+				
		3810.59 *5*	40 *4*	1039.2279	2^+				
4866.056	1^+	1195.32 *9*	2.9 *11*	3670.72	2^+				
		1433.63 *4*	5.9 *12*	3432.408	1^-				
		1534.60 *4*	19 *5*	3331.441	2^+				
		1927.96 *4*	7.2 *24*	2938.074	2^+				

$^{66}_{30}Zn_{36}$-16

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

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Mult.	δ[a]	α[†]	Comments
4866.056	1+	2085.86 4	7 5	2780.157	2+				
		2993.21 3	100 10	1872.7653	2+				
		4865.87 4	8.8 7	0.0	0+				
4958.2	1+	3085.4 4	100	1872.7653	2+				
5005.8	1+	5005.6 3	100	0.0	0+				
5111.9	(8−)	860.8[c] 8	11[c] 3	4251.9	(7−)	(M1+E2)[&]	+0.21 15	0.000344 8	α(K)=0.000308 7; α(L)=3.08×10^{-5} 8; α(M)=4.42×10^{-6} 11; α(N+..)=1.78×10^{-7} 4 α(N)=1.78×10^{-7} 4
		1036.0[c] 3	100[c] 3	4075.7	(6−)				
5207.3	(8+)	954.2[c] 5	82[c] 16	4251.9	(7−)	(E1)[&]		0.0001395 20	B(E1)(W.u.)<3.6×10^{-5} α(K)=0.0001252 18; α(L)=1.244×10^{-5} 18; α(M)=1.78×10^{-6} 3 α(N)=7.18×10^{-8} 10 δ(M2/E1)=−0.00 8. E_γ: doublet reported in ^{64}Ni(α,2nγ).
		1025.8[c] 5	100[c] 11	4182.7	(6+)	(E2)[@]		0.000277 4	α(K)=0.000248 4; α(L)=2.49×10^{-5} 4; α(M)=3.56×10^{-6} 5; α(N+..)=1.427×10^{-7} 20 α(N)=1.427×10^{-7} 20 B(E2)(W.u.)<2.9 δ(M3/E2)=−0.04 6.
5464.4	(9−)	1212.5[c] 4	100[c]	4251.9	(7−)	(E2)[@]		0.000200 3	α(K)=0.0001697 24; α(L)=1.695×10^{-5} 24; α(M)=2.43×10^{-6} 4; α(N+..)=1.073×10^{-5} α(N)=9.76×10^{-8} 14; α(IPF)=1.063×10^{-5} 17 B(E2)(W.u.)=7 3 δ(M3/E2)=−0.04 4.
6292.6	(10+)	828[ch] 1	<22[c]	5464.4	(9−)				
		1085.3[c] 4	100[c] 9	5207.3	(8+)	(E2)[@]		0.000243 4	α(K)=0.000218 3; α(L)=2.18×10^{-5} 3; α(M)=3.12×10^{-6} 5; α(N+..)=1.252×10^{-7} 18 α(N)=1.252×10^{-7} 18 B(E2)(W.u.)=13 +4−7 δ(M3/E2)=+0.04 6.
6419.0		1307.1[c] 7	100[c]	5111.9	(8−)				
7367.4	1	2732	1.9 12	4635.3	(2)				
		3071[h]	2.1 12	4295.339	1+				
		3293[h]	≈0.5	4075.7	(6−)				
		3356[h]	0.4 2	4011.7					
		3485	2.1 7	3882.424	(2)+				
		3544	1.6 5	3825.0	0+				

$^{66}_{30}$Zn$_{36}$-17

Adopted Levels, Gammas (continued)

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

E_i(level)	J^π_i	E_γ[‡]	I_γ[#]	E_f	J^π_f	Comments
7367.4	1	3793[h]	≈0.5	3576.370	4^+	
		3835	1.6 *7*	3531.692	0^+	E_γ: rounded-off value from level energy difference; 3840 from (γ,γ').
		4141	1.0 *6*	3226.2		
		4262	8.1 *20*	3105.040	0^+	
		4428	2.1 *6*	2938.074	2^+	
		4587	3.8 *12*	2780.157	2^+	E_γ: rounded off value from level energy difference; 4591 from (γ,γ').
		4995[h]	≤0.4	2372.353	0^+	
		5495	14.3 *7*	1872.7653	2^+	
		6326	≈0.3	1039.2279	2^+	
		7368	100	0.0	0^+	
7517.3		1224.7[c] *7*	100[c]	6292.6	(10^+)	
7693.3	1	4187	8 *2*	3507.249	2^+	
		4263	25 *3*	3432.408	1^-	
		4361	13 *2*	3331.441	2^+	
		4452	7 *2*	3241.2?		
		4480	21 *2*	3212.582	2^+	
		4587	8 *1*	3105.040	0^+	
		4755	24 *2*	2938.074	2^+	
		4930	<2	2762.8	(2)	I_γ: relative branching also reported as 8 in $^{66}Zn(\gamma,\gamma')$.
		5321	<3	2372.353	0^+	
		5819	<2	1872.7653	2^+	
		6654	42 *1*	1039.2279	2^+	
		7693	100 *1*	0.0	0^+	

† Additional information 2.
‡ From ^{66}Ga ε decay, except as noted. Energies of γ's depopulating levels above 7 MeV are from $^{66}Zn(\gamma,\gamma')$.
\# Relative-photon branching from each level from ^{66}Ga ε decay, except as noted. Branchings for γ's depopulating levels above 7 MeV are from $^{66}Zn(\gamma,\gamma')$.
@ From $\gamma(\theta)$ in $^{64}Ni(\alpha,2n\gamma)$ and RUL.
& From $\gamma(\theta)$ in $^{64}Ni(\alpha,2n\gamma)$ and ΔJ^π.
a From $\gamma(\theta)$ in $^{64}Ni(\alpha,2n\gamma)$, except as noted.
b From $^{66}Zn(n,n'\gamma)$.
c From $^{64}Ni(\alpha,2n\gamma)$.
d From $^{66}Zn(p,p'\gamma)$.
e From level energy differences in $^{65}Cu(p,\gamma)$. Uncertainty not given, but has been chosen by the evaluators to be 0.5 keV (an approximate upper limit).
f From $^{66}Zn(p,p'\gamma)$. Uncertainties not given in the source data but are estimated as ≈2-20%.
g From $^{65}Cu(p,\gamma)$.
h Placement of transition in the level scheme is uncertain.

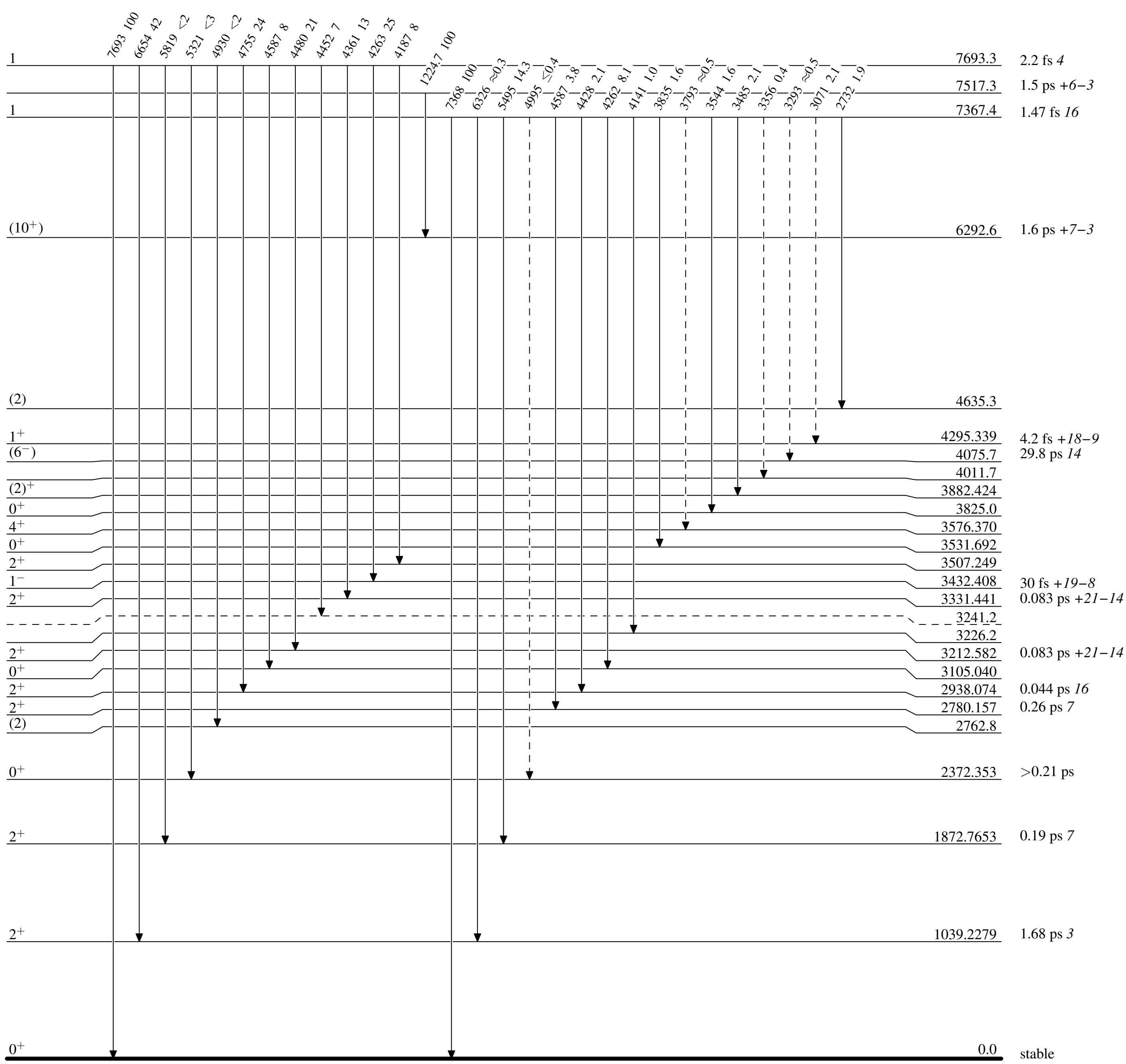
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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

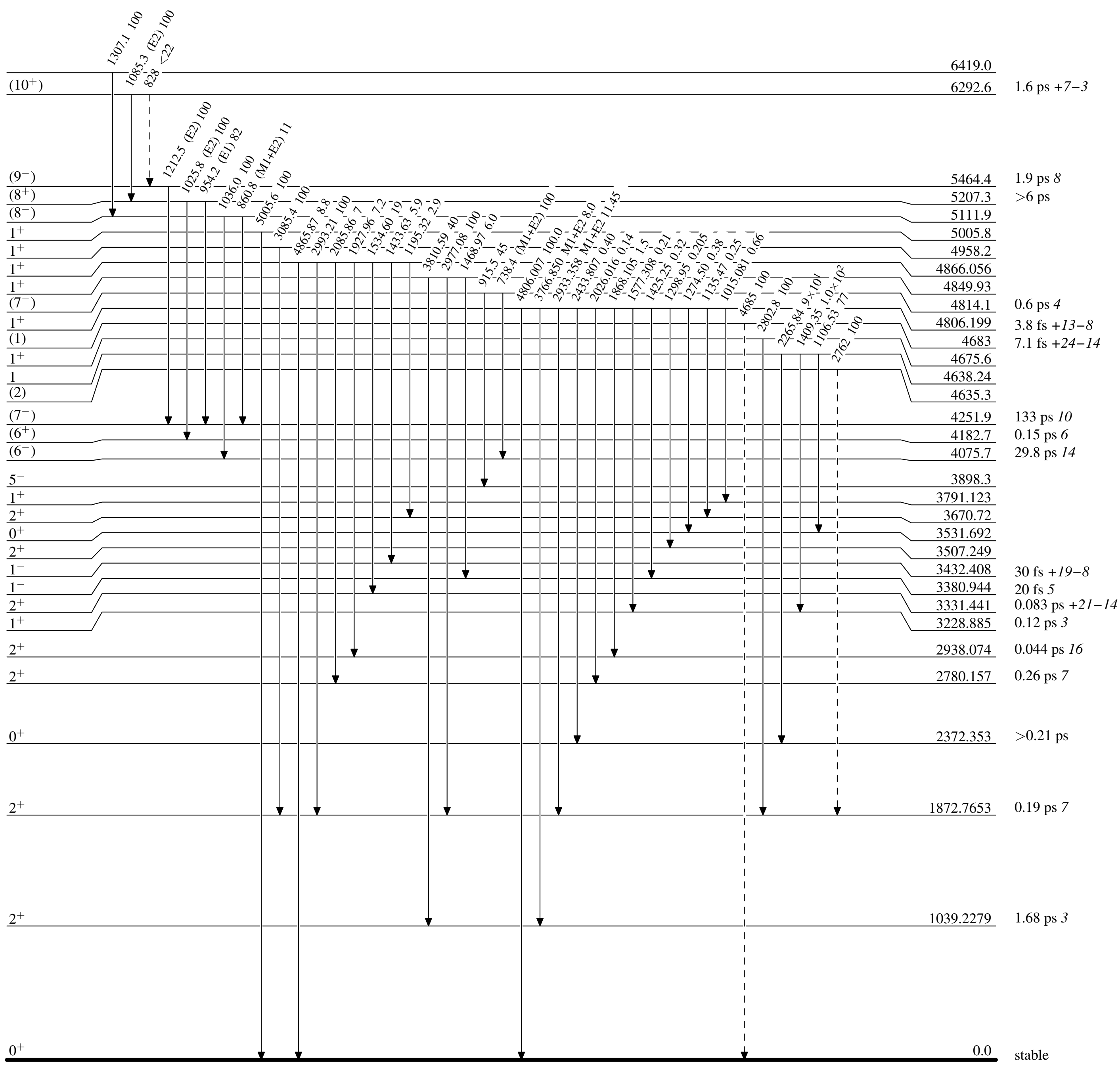
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



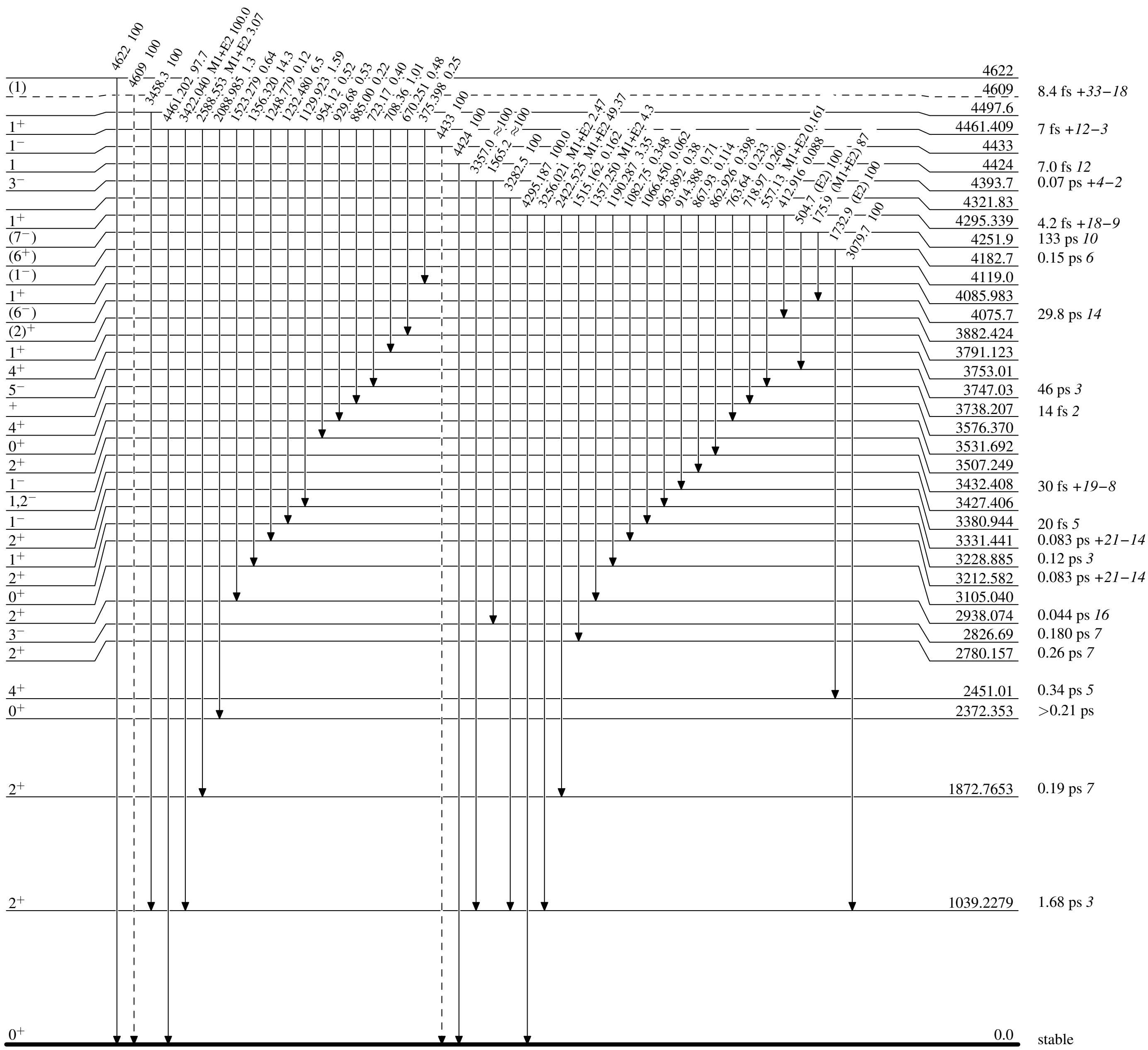
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



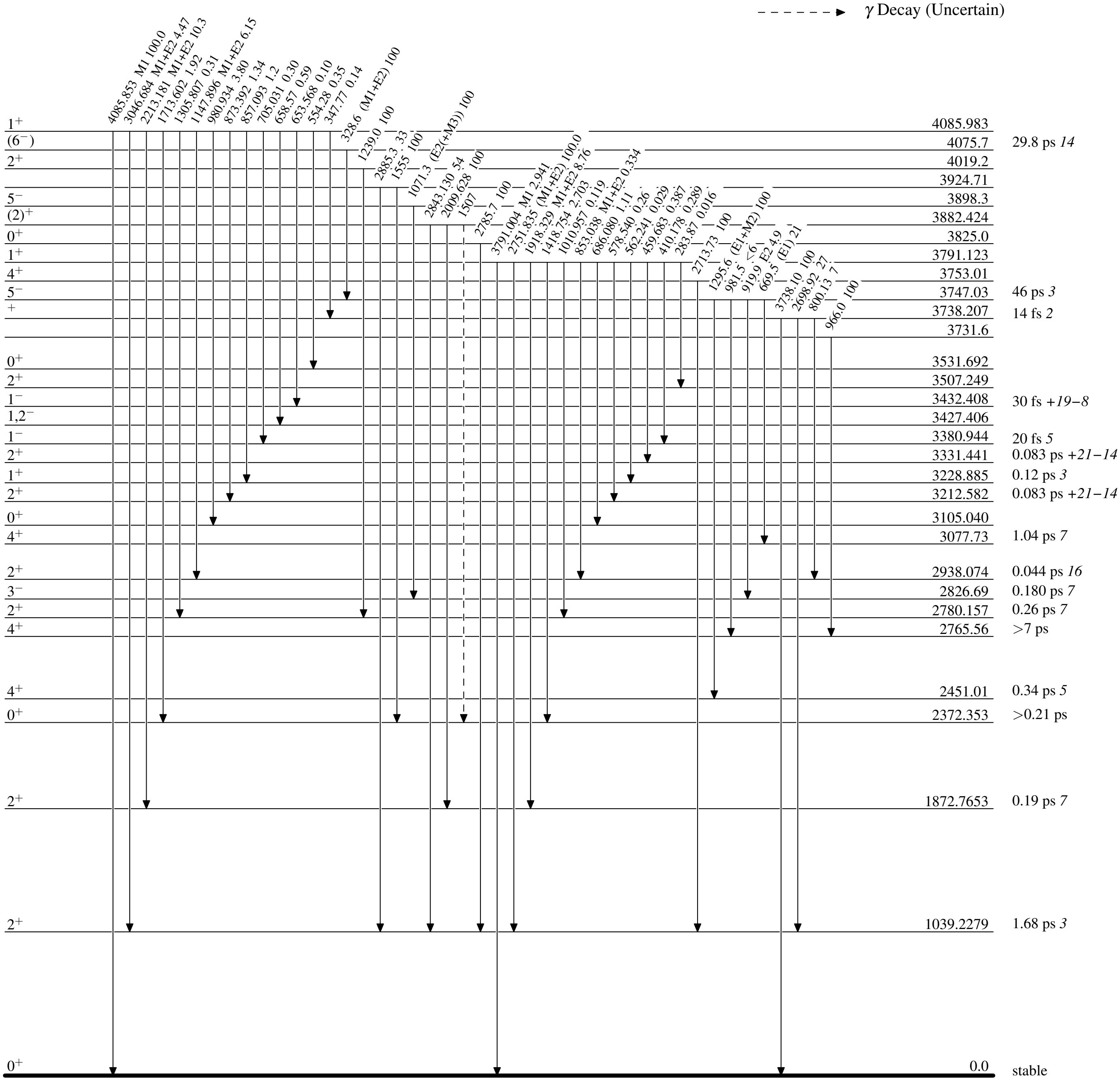
$^{66}_{30}Zn_{36}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

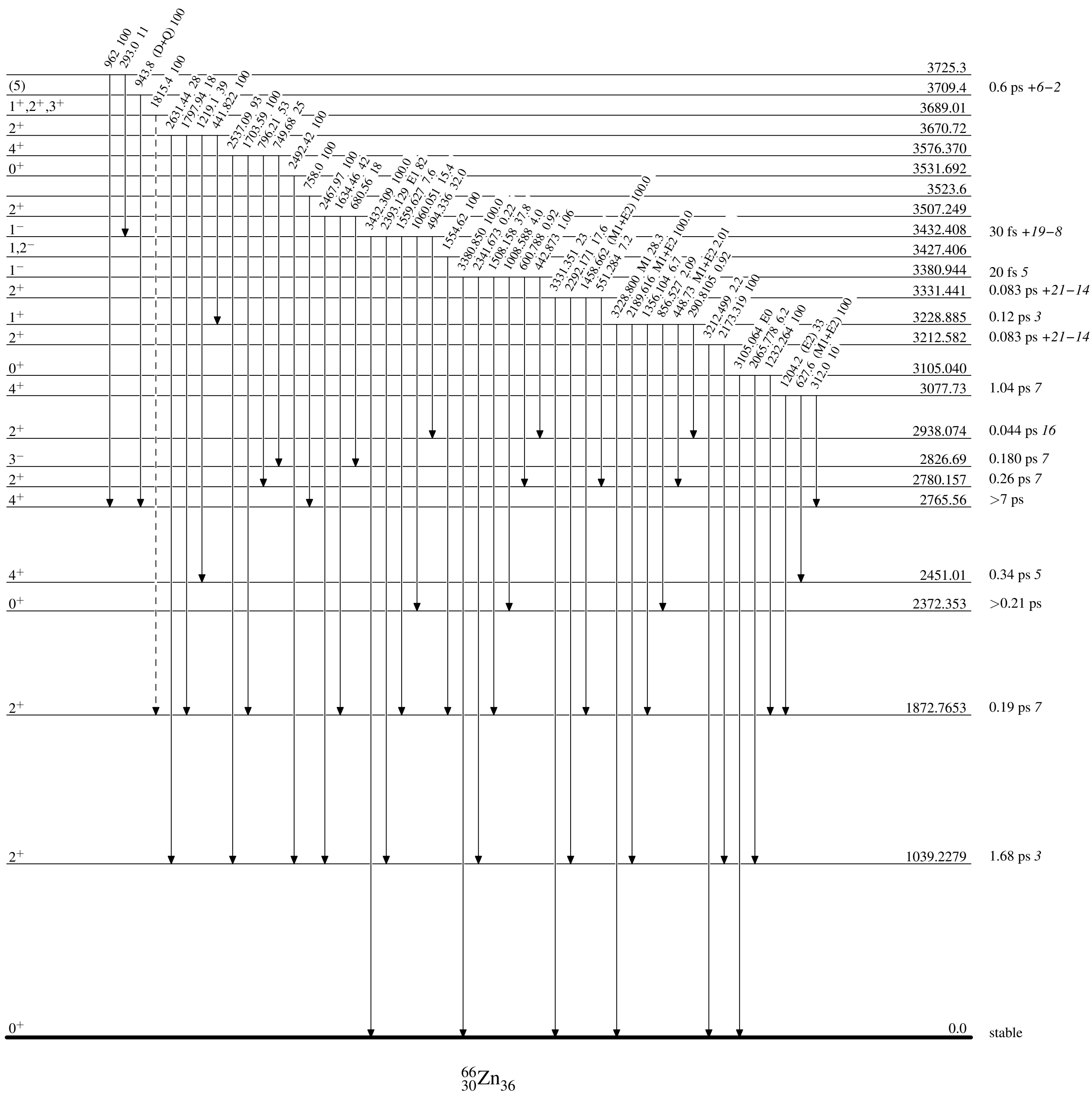
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level