^{62}Zn $\varepsilon+\beta^+$ decay (9.197 h) 1974Jo11,1973Gi01,1967An01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Huang Xiaolong, and Wang Xianghan	NDS 204,1 (2025)	30-Jun-2023

Parent: ^{62}Zn: E=0.0; J$^{\pi}$=0$^+$; $T_{1/2}$=9.197 h *20*; Q(ε)=1619.5 *7*; %ε+%β^+ decay=100

^{62}Zn-$T_{1/2}$: From ^{62}Zn Adopted Levels.

^{62}Zn-Q($\varepsilon+\beta^+$): From 2021Wa16.

1974Jo11 (also 1971JoZN thesis): ^{62}Zn from Cu(p,2n),E=25 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin using Ge(Li) detector with Compton suppression. A total of 31 γ rays from 41 to 1526 keV were assigned to the decay of ^{62}Zn.

Additional information 1.

1973Gi01: ^{62}Zn from Cu(p,2n),E=25 MeV. Measured Eγ, Iγ using Ge(Li) detector. Energies and intensities of 19 γ rays reported.

1967An01: ^{62}Zn from ^{63}Cu(p,2n). Measured Eγ, Iγ using Ge(Li) detector, conversion electrons and positrons using a double-focusing iron-yoke β spectrometer. Authors present detailed spectra of conversion electron lines for different atomic shells, but the intensities are provided for only the K-shell conversion.

1969Ho01: ^{62}Zn from Ni(^{3}He,n),E<10 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin using Ge(Li) detectors. Energies and intensities of 11 rays from 41 to 637 keV reported. Deduced α(K)exp from ce data in 1967An01 and Iγ values in their work. Spectra from separated ^{62}Zn activity were measured using an anion exchange column and every five minutes discarding the 9.67-min ^{62}Cu daughter activity.

Others:

1982Gr10: ^{62}Zn from Cu(p,2n),E=15-70 MeV. Measured Eγ, Iγ, and $T_{1/2}$ of ^{62}Zn decay using Ge(Li) detector. Relative intensities of six γ rays reported.

1975Ro25 (also 1974RoZD thesis): ^{62}Zn from Cu(p,2n),E=25 MeV. Measured $T_{1/2}$ of 41-keV level by $\gamma\gamma$(t).

1974Wa09: ^{62}Zn from ^{60}Ni(α,2n),E not stated. An ion-exchange column was used for separation of ^{62}Zn and ^{62}Cu fractions. Measured Eγ, Iγ using Ge(Li) detector. Relative intensities of ten γ rays from 243 to 637 keV were reported, and that of annihilation radiation. Deduced Iβ^+.

1970BoZE: measured g factor of 41-keV level by perturbed angular correlation technique through the 596γ-41γ cascade.

1968Ba21: measured Eγ, Iγ, $\gamma\gamma$-coin, level half-life by $\gamma\gamma$(t), $T_{1/2}$ of ^{62}Zn decay using Ge(Li) and NaI(Tl) detectors. Eight γ rays reported from 42 to 682 keV. The γ-ray energies are given to nearest keV.

1967Ro01: ^{62}Zn from ^{63}Cu(p,2n),E=25 MeV measured Eγ, Iγ of 11 γ rays from 42 to 639 keV using Ge(Li) detector.

1967Wi20: measured Eγ, Iγ of 547γ and 590γ using Ge(Li) detector.

1957Br20: measured Eγ, Iγ, $\gamma\gamma$-coin, $\beta\gamma$-coin, $\gamma\gamma$(t), $\gamma\gamma(\theta)$ using NaI(Tl) detectors. Seven γ rays reported from 42 to 700 keV.

1954Nu27: measured conversion electrons for 41-keV transition using magnetic spectrometer.

1950Ha65: measured conversion electrons for 41-keV transition, Eβ^+, ε/β^+ ratio using magnetic spectrometer.

Total decay energy of 1637 keV *92* deduced (by RADLIST code) from proposed decay scheme is in agreement with the expected value of 1619.5 keV *7*, indicating that decay scheme is complete.

^{62}Cu Levels

Levels at 1142 keV and 1281 keV proposed by 1973Gi01 simply on the basis of g.s. transitions for both levels are rejected by 1974Jo11, since the 1142γ is seen in coincidence with the 247γ, and no evidence was found for the existence of a 1280.8γ reported by 1973Gi01. Note that an 1141.6-keV level is populated in in-beam γ-ray data, but none of the γ rays from this level reported in the reaction data seen in ^{62}Zn decay.

A 682 level reported by 1968Ba21 is omitted here as a 682γ reported in this work as g.s. transition is not observed in any other study. The 394γ placed from this level in 1968Ba21 is assigned, instead, from 637 level based on $\gamma\gamma$-coin data.

E(level)†	J$^{\pi}$‡	$T_{1/2}$‡	Comments
0.0	1$^+$	9.672 min *8*	
40.847 *32*	2$^+$	4.57 ns *18*	g=+0.67 *6* (PAC,1970BoZE). $T_{1/2}$: (507γ+596γ)(41γ)(t) (1975Ro25). Others: 4.8 ns *1* (1969BoZR), 2.5 ns *1* (1968Ba21), <8 ns (1957Br20). Additional information 2.
243.441 *25*	2$^+$		

Continued on next page (footnotes at end of table)

^{62}Zn $\varepsilon+\beta^+$ decay (9.197 h) 1974Jo11,1973Gi01,1967An01 (continued)

^{62}Cu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$‡	Comments
287.87 *4*	2^+		
426.16 *7*	3^+	>0.16 ps	
548.374 *32*	1^+	>0.17 ps	
637.484 *31*	1^+	0.15 ps *+28−8*	
644.82 *6*	(2^+)		
698.39 *12*	$(3)^+$		
915.33 *7*	2^+		
1221.51 *20*	(0 to 3)$^+$		Jπ: if ε feeding to this level is real, then J=2 and 3 are not possible.
1429.60 *7*	1^+		
1525.98 *17*	1^+		

† From least-squares fit to Eγ data, keeping energy of 40.89-keV level as fixed.
‡ From the Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I(ε+β^+)†	Comments
(93.5 *12*)	1525.98		0.0089 *14*	5.99 *7*		εK=0.8673 *2*; εL=0.11261 *15*; εM+=0.02006 *3*
(189.9 *12*)	1429.60		0.101 *6*	5.59 *3*		εK=0.8778; εL=0.10385 *3*; εM+=0.018307 *6*
(398.0‡ *13*)	1221.51		0.00146 *24*	8.1 *1*		εK=0.8827; εL=0.09981; εM+=0.01750 Iε: weak feeding is considered uncertain. Unobserved weak γ rays feeding the 1221.5 level may be responsible for this feeding.
(704.2‡ *12*)	915.33		<0.038	>7.2		εK=0.8845; εL=0.09828; εM+=0.01719 No direct ε feeding is expected from 0^+ parent to a 2^+ level. Apparent ε feeding of 0.0351 *24* may be due to an unreported weak 514.3γ from 1429.6 level, which would be obscured by the 511-keV annihilation radiation.
(974.7‡ *12*)	644.82		<0.0148	>7.9		εK=0.8852; εL=0.09773; εM+=0.01709 No direct ε feeding is expected from 0^+ parent to a 2^+ level. Apparent ε feeding of 0.0138 *10* may be due to unobserved weak γ rays feeding the 644.8 level.
(982.0 *12*)	637.484		28.1 *12*	4.61 *2*		εK=0.8852; εL=0.09772; εM+=0.01708
(1071.1 *12*)	548.374		31.3 *15*	4.63 *2*	31.3 *15*	εK=0.8853; εL=0.09761; εM+=0.01706
(1619.5 *16*)	0.0	8.4 *6*	33 *2*	4.98 *4*	41 *3*	av Eβ=255.44 *30*; εK=0.7052 *6*; εL=0.07736 *7*; εM+=0.01351 *2* Measured Eβ^+=0.66 MeV *1* (1950Ha65), which gives Q(ε)=1682 *10*.

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{62}Cu)

Iγ normalization: From unweighted average of 0.241 *12*, 0.270 *7* and 0.241 *9* obtained from three different measurements as follows: 1. 0.241 *12* from total activity (in relative units) of decay of ^{62}Zn=415 *21*, deduced from observed I($\gamma^{\pm}$)=824 *41* (1974Jo11) in ^{62}Zn/^{62}Cu transient equilibrium. Observed I($\gamma^{\pm}$) represents 97.589% *25* β^+ branching in the decay of ^{62}Cu. True intensity of I($\gamma^{\pm}$) from ^{62}Cu decay is corrected by a factor of [$T_{1/2}$(^{62}Zn)-$T_{1/2}$(^{62}Cu)]/$T_{1/2}$(^{62}Zn) = 0.9825 *21*. 2. 0.270 *7* from total activity (in relative units) of decay of ^{62}Zn=370 *10* from measured I($\gamma^{\pm}$)=55.1 *27* (1974Wa09) in separated ^{62}Zn activity by ion-exchange column, theoretical value of Iε/Iβ^+(to g.s.)=3.904 *35*, and summed I(γ+ce) to the g.s. in the present decay scheme. 3. 0.241 *9* from measured I(β^++ε)=43.4 *8* (1969Ho01), and I(γ+ce)(to g.s.) = 56.6 *8*, in ^{62}Zn/^{62}Cu transient equilibrium. Measured intensity of the annihilation radiation is not listed by authors.

Measured I($\gamma^{\pm}$)=824 *41* (1974Jo11), relative to 100 for 597γ, for ^{62}Zn/^{62}Cu in equilibrium.

Measured I($\gamma^{\pm}$)=55.10 *27* (1974Wa09), relative to 100 for 597γ, from eluted ^{62}Zn activity. Also measured Iγ(1173γ from ^{62}Cu decay)/I($\gamma^{\pm}$)=0.416 *6* from ^{62}Zn/^{62}Cu in equilibrium, and 0.354 *27* from eluted ^{62}Cu activity; the difference in the two relative intensities attributed ^{62}Zn positron contribution.

Measured I(β^++ε)=43.4% *8*, I(ε_K)/I(β^+)=4.4 *9* (1969Ho01, as given in text without giving measured intensities of I($\gamma^{\pm}$) and K x-rays; also in the abstract authors quote I(β^++ε)=43% *5*, I(β^+)/I(ε_K)=0.22 *1*).

α(K)exp deduced by evaluators from measured Ice(K) values in 1967An01, and Iγ values recommended in this dataset. Note that 1967An01, in their Table 1, listed Ice(K) normalized to theoretical α(K) values for the 40.9γ and 596.6γ for mult=M1 for both. Evaluators treat the listed Ice(K) values as relative intensities, and deduced α(K)exp for γ-ray energies using α(K)=0.575 *8* for the 40.9γ.

A 1280.8 *15* γ reported by 1973Gi01 with Iγ=0.03 *1* is not confirmed by 1974Jo11 within an upper limit of Iγ<0.005.

A 682γ, with Iγ≈4 *2* reported by 1968Ba21 is not observed in any other studies, thus omitted here.

E_γ[†]	I_γ[‡a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
40.89 *6*	99 *4*	40.847	2^+	0.0	1^+	M1	0.645 *9*	%Iγ=24.9 *14* α(exp)=0.665 *30* α(K)=0.575 *8*; α(L)=0.0607 *9*; α(M)=0.00854 *12* α(N)=0.000249 *4* Eγ=40.85 *6*, Iγ=98 *5* (1974Jo11). Eγ=40.94 *6*, Iγ=104 *10* (1973Gi01). Eγ=40.84 *13*, Iγ=99.4 *35* (1969Ho01). Eγ=40.88 *9*, Iγ=102 (deduced) (1967An01). Eγ=41.5 *2*, I(γ+ce)=192 *19* (1967Ro01). Eγ=41.3 *3* (1954Nu27), 41.8 *3* (1950Ha65); both from ce data. Ice(K)=60.2 *8* (1967An01; K−, L− and M+N−shell lines observed in conversion electron spectra). α(exp) deduced by evaluators from transition intensity balance at at 40.8-keV level. Measured K/(L+M)=8.0 *15* (1954Nu27), ≥6.4 (1950Ha65). Measured L1/(L2+L3)>10 (1967An01). Theoretical values from BrIcc: K/(L+M)=8.33 for M1, 5.23 for E2, and 9.6 for E1; L1/(L2+L3)=12.3 for M1, 0.88 for E2, and 5.4 for E1.

γ(^{62}Cu) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[b]	Comments
								Others: α(K)exp=0.52 *8* (1954Nu27, corrected to 0.49 *8* by 1957Br20 for the presence of 511-annihilation radiation); α(exp)=0.65 *10* (1957Br20, deduced from decay scheme); Mult.: E1 or M1 from K/(L+M) ratio; M1 from α(exp), α(K)exp, and L-subshell ratio. Using α(exp) and K/(L+M), δ(E2/M1)<0.056 from BrIccMixing code.
202.67[#] *6*	0.042[#] *5*	243.441	2$^+$	40.847	2$^+$	[M1+E2]	0.025 *17*	%Iγ=0.0105 *13*
243.42 *3*	10.04 *27*	243.441	2$^+$	0.0	1$^+$	M1	0.00539 *8*	%Iγ=2.52 *12* α(K)exp=0.00452 *27* α(K)=0.00483 *7*; α(L)=0.000488 *7*; α(M)=6.86×10^{-5} *10* α(N)=2.072×10^{-6} *29* Iγ=9.80 *25* (1982Gr10), 8.36 *29* (1974Wa09). Eγ=243.36 *6*, Iγ=9.7 *5* (1974Jo11). Eγ=243.44 *3*, Iγ=11.1 *5* (1973Gi01). Eγ=243.18 *15*, Iγ=10.3 *5* (1969Ho01). Eγ=243.40 *5*, Iγ≈7 (1967An01); Iγ=11.0 *9* for 243γ+247γ. Eγ=243.7 *5*, Iγ=15.4 *16* (1967Ro01). Ice(K)=0.0480 *14* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). α(K)exp is slightly lower that α(K) for M1.
247.00 *4*	7.64 *25*	287.87	2$^+$	40.847	2$^+$	M1	0.00520 *7*	%Iγ=1.92 *10* α(K)exp=0.00388 *25* α(K)=0.00466 *7*; α(L)=0.000470 *7*; α(M)=6.62×10^{-5} *9* α(N)=1.999×10^{-6} *28* Iγ=7.35 *19* (1982Gr10), 6.38 *23* (1974Wa09). Eγ=246.95 *6*, Iγ=7.3 *4* (1974Jo11). Eγ=247.04 *4*, Iγ=8.3 *4* (1973Gi01). Eγ=246.70 *10*, Iγ=8.2 *3* (1969Ho01). Eγ=247.02 *9*, Iγ≈4 (1967An01); Iγ=11.0 *9* for 243γ+247γ. Eγ=247.2 *5*, Iγ=11.5 *12* (1967Ro01). Ice(K)=0.0313 *9* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). α(K)exp is lower than α(K) for M1.
260.48 *6*	5.68 *16*	548.374	1$^+$	287.87	2$^+$	M1	0.00456 *6*	%Iγ=1.43 *7* α(K)exp=0.00338 *30* α(K)=0.00409 *6*; α(L)=0.000412 *6*; α(M)=5.80×10^{-5} *8* α(N)=1.754×10^{-6} *25* Iγ=5.35 *13* (1982Gr10), 3.43 *54* (1974Wa09). Eγ=260.43 *7*, Iγ=5.2 *3* (1974Jo11). Eγ=260.50 *6*, Iγ=5.9 *3* (1973Gi01). Eγ=260.32 *6*, Iγ=5.9 *1* (1969Ho01). Eγ=260.44 *10*, Iγ=2.6 *5* (1967An01).

γ(^{62}Cu) (continued)

E$_{\gamma}$[†]	I$_{\gamma}$[‡a]	E$_i$(level)	J$^{\pi}_{i}$	E$_f$	J$^{\pi}_{f}$	Mult.[&]	δ	α[b]	Comments
									Eγ=260.7 *5*, Iγ=8.5 *9* (1967Ro01). Ice(K)=0.0203 *14* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). α(K)exp is lower than α(K) for M1.
(272.3[@] *3*)	0.0033	698.39	(3)$^+$	426.16	3$^+$				%Iγ=8.3×10^{-4}
304.92 *7*	1.20 *7*	548.374	1$^+$	243.441	2$^+$	[M1+E2]		0.006 *4*	%Iγ=0.301 *21* Iγ=0.61 *17* (1974Wa09). Eγ=304.88 *9*, Iγ=1.11 *6* (1974Jo11). Eγ=305.00 *7*, Iγ=1.2 *1* (1973Gi01). Eγ=304.60 *11*, Iγ=1.32 *7* (1969Ho01). Eγ=305.5 *10*, Iγ=0.77 *8* (1967Ro01).
349.54 *7*	1.74 *11*	637.484	1$^+$	287.87	2$^+$	M1+E2	1.0 *+5−4*	0.0041 *9*	%Iγ=0.437 *33* α(K)exp=0.0037 *6* α(K)=0.0037 *8*; α(L)=0.00037 *8*; α(M)=5.2×10^{-5} *11* α(N)=1.53×10^{-6} *32* Iγ=0.44 *16* (1974Wa09). Eγ=349.60 *13*, Iγ=1.73 *11* (1974Jo11). Eγ=349.59 *7*, Iγ=1.8 *1* (1973Gi01). Eγ=349.22 *9*, Iγ=1.59 *16* (1969Ho01). Eγ=349.69 *25*, Iγ≈1 (1967An01). Eγ=349.5 *10*, Iγ=1.54 *16* (1967Ro01). Ice(K)=0.0068 *10* (1967An01). α(K)exp from ce data in 1967An01 gives δ(E2/M1)=1.0 *+5−4*, but this value gives B(E2)(W.u.)=400 *+800−300*, as compared to RUL=300 for B(E2)(W.u).
385.31 *9*	0.068 *6*	426.16	3$^+$	40.847	2$^+$				%Iγ=0.0171 *17* Eγ=385.31 *9*, Iγ=0.067 *6* (1974Jo11). Eγ=385.2 *4*, Iγ=0.08 *2* (1973Gi01).
394.05 *4*	8.99 *18*	637.484	1$^+$	243.441	2$^+$	M1+E2	0.78 *+26−22*	0.00255 *32*	%Iγ=2.26 *10* α(K)exp=0.00228 *28* α(K)=0.00228 *29*; α(L)=0.000231 *29*; α(M)=3.2×10^{-5} *4* α(N)=9.6×10^{-7} *12* Iγ=8.42 *23* (1982Gr10), 7.01 *73* (1974Wa09). Eγ=394.03 *6*, Iγ=8.6 *4* (1974Jo11); Δ(Iγ)=0.04 in 1974Jo11 seems too low to be realistic, evaluators increase it to 0.4. Eγ=394.06 *4*, Iγ=9.2 *4* (1973Gi01). Eγ=393.84 *6*, Iγ=9.16 *12* (1969Ho01). Eγ=394.12 *18*, Iγ=6.2 *10* (1967An01). Eγ=394.5 *5*, Iγ=10.8 *11* (1967Ro01). Ice(K)=0.0217 *24* (1967An01; K− and L+M−shell lines observed in

γ(^{62}Cu) (continued)

Eγ[†]	Iγ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ	α[b]	Comments
									conversion electron spectra). α(K)exp from ce data in 1967An01 gives δ(E2/M1)=0.78 *+26−22*, but this value gives B(E2)(W.u.)=800 $^{1100-500}$, as compared to RUL=300 for B(E2)(W.u). For this reason, E2 assigned un 1967An01 is correct.
(455.0[@] *3*)	0.0046	698.39	(3)$^+$	243.441	2$^+$				%Iγ=1.16×10^{-3}
489.17 *7*	0.061 *6*	915.33	2$^+$	426.16	3$^+$				%Iγ=0.0153 *16* Eγ=489.17 *7*, Iγ=0.061 *6* (1974Jo11). Eγ=489.1 *4*, Iγ=0.06 *2* (1973Gi01).
507.58 *10*	57 *3*	548.374	1$^+$	40.847	2$^+$	M1+E2	0.86 *+24−22*	0.00128 *11*	%Iγ=14.3 *10* α(K)exp=0.00115 *9* α(K)=0.00115 *10*; α(L)=0.000115 *10*; α(M)=1.62×10^{-5} *14* α(N)=4.9×10^{-7} *4* Iγ=65.90 *54* (1974Wa09). Eγ=507.60 *10*, Iγ=57 *3* (1974Jo11). Eγ=507.5 *4*, Iγ=58 *10* (1973Gi01). Eγ=507.2 *10*, Iγ=65 *15* (1969Ho01). Eγ=507.57 *13*, Iγ=60 *15* (1967An01). Eγ=507.5 *10*, Iγ=77 *8* (1967Ro01). Ice(K)=0.0693 *20* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). α(K)exp from ce data in 1967An01 gives δ(E2/M1)=0.86 *+24−20*, but this value gives B(E2)(W.u.)<1760, as compared to RUL=300 for B(E2)(W.u).
548.38 *4*	60.6 *10*	548.374	1$^+$	0.0	1$^+$	M1+E2	0.51 *15*	0.00092 *6*	%Iγ=15.2 *7* α(K)exp=0.00082 *5* α(K)=0.00082 *5*; α(L)=8.2×10^{-5} *5*; α(M)=1.15×10^{-5} *7* α(N)=3.49×10^{-7} *21* Iγ=59.7 *14* (1982Gr10), 59.1 *11* (1974Wa09). Eγ=548.35 *11*, Iγ=59 *3* (1974Jo11). Eγ=548.41 *4*, Iγ=60.8 *10* (1973Gi01). Eγ=548.33 *6*, Iγ=62.2 *9* (1969Ho01). Eγ=548.33 *22*, Iγ=54 *5* (1967An01). Eγ=548.7 *5*, Iγ=65 *7* (1967Ro01). Ice(K)=0.0528 *12* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). α(K)exp from ce data in 1967An01 gives δ(E2/M1)=0.51 *15*, but this value gives B(E2)(W.u.)<700, as compared to RUL=300 for B(E2)(W.u).
596.63 *4*	100	637.484	1$^+$	40.847	2$^+$	M1		6.64×10^{-4} *9*	%Iγ=25.1 *10* α(K)exp=0.000558 *28*

$^{62}_{29}Cu_{33}$-6

γ(^{62}Cu) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
								α(K)=0.000596 *8*; α(L)=5.92×10^{-5} *8*; α(M)=8.33×10^{-6} *12* α(N)=2.54×10^{-7} *4* Iγ=100 (1982Gr10), 100 (1974Wa09). Eγ=596.56 *13*, Iγ=100 (1974Jo11). Eγ=596.65 *4*, Iγ=100 (1973Gi01). Eγ=596.60 *6*, Iγ=100 (1969Ho01). Eγ=596.68 *20*, Iγ=100 *8* (1967An01). Eγ=597.0 *5*, Iγ=100 *10* (1967Ro01). Ice(K)=0.0590 *13* (1967An01; K− and L+M−shell lines observed in conversion electron spectra). Mult.: α(K)exp in slightly lower than α(K) for M1.
627.8[#] *4*	0.003[#] *1*	915.33	2$^+$	287.87	2$^+$			%Iγ=0.00075 *25*
637.47 *6*	0.97 *6*	637.484	1$^+$	0.0	1$^+$	M1+E2	0.00072 *15*	%Iγ=0.244 *18* α(K)exp=0.0015 *7* α(K)=0.00065 *13*; α(L)=6.5×10^{-5} *14*; α(M)=9.1×10^{-6} *19* α(N)=2.8×10^{-7} *5* Iγ=0.89 *9* (1974Wa09). Eγ=637.41 *7*, Iγ=0.98 *6* (1974Jo11). Eγ=637.53 *6*, Iγ=0.96 *6* (1973Gi01). Eγ=637.25 *6*, Iγ=3.45 *25* (1969Ho01, Iγ is much larger than in other studies as it is not corrected for summing, as pointed out in 1974Jo11; this value is not used in averaging). Eγ=636.9 *5*, Iγ≤1 (1967An01). Eγ=638.5 *10*, Iγ=1.54 *16* (1967Ro01). Ice(K)=0.0015 *7* (1967An01).
644.82[#] *6*	0.055[#] *3*	644.82	(2$^+$)	0.0	1$^+$			%Iγ=0.0138 *9*
657.5[#] *5*	0.005[#] *1*	698.39	(3)$^+$	40.847	2$^+$			%Iγ=0.00126 *26*
671.84[#] *9*	0.017[#] *2*	915.33	2$^+$	243.441	2$^+$			%Iγ=0.0043 *5*
731.23[#] *15*	0.0088[#] *12*	1429.60	1$^+$	698.39	(3)$^+$			%Iγ=0.00221 *31*
792.03[#] *7*	0.034[#] *3*	1429.60	1$^+$	637.484	1$^+$			%Iγ=0.0085 *8*
827.59[#] *14*	0.0115[#] *14*	1525.98	1$^+$	698.39	(3)$^+$			%Iγ=0.0029 *4*
881.4 *3*	0.056 *4*	1429.60	1$^+$	548.374	1$^+$			%Iγ=0.0141 *12* Eγ=881.4 *3*, Iγ=0.056 *4* (1974Jo11). Eγ=881.4 *8*, Iγ=0.08 *3* (1973Gi01).
915.45 *16*	0.059 *4*	915.33	2$^+$	0.0	1$^+$			%Iγ=0.0148 *12* Eγ=915.44 *16*, Iγ=0.059 *4* (1974Jo11). Eγ=915.6 *6*, Iγ=0.08 *3* (1973Gi01).
1142.21 *29*	0.133 *8*	1429.60	1$^+$	287.87	2$^+$			%Iγ=0.0334 *24* Eγ=1141.91 *11*, Iγ=0.133 *8* (1974Jo11). Eγ=1142.5 *2*, Iγ=0.13 *3* (1973Gi01).
1186.2[#] *3*	0.015[#] *5*	1429.60	1$^+$	243.441	2$^+$			%Iγ=0.0038 *13*

$^{62}_{29}$Cu$_{33}$-7

γ(^{62}Cu) (continued)

E_γ [†]	I_γ [‡a]	E_i(level)	J^π_i	E_f	J^π_f	Comments
1221.5[#] 2	0.0058[#] 9	1221.51	(0 to 3)$^+$	0.0	1$^+$	%Iγ=0.00146 23
[x]1321.3 7	0.0026 10					%Iγ=0.00065 25
1389.1 4	0.045 3	1429.60	1$^+$	40.847	2$^+$	%Iγ=0.0113 9 Eγ=1389.1 4, Iγ=0.045 3 (1974Jo11). Eγ=1389.1 5, Iγ=0.05 2 (1973Gi01).
1429.9 3	0.111 10	1429.60	1$^+$	0.0	1$^+$	%Iγ=0.0279 28 Eγ=1429.7 7, Iγ=0.106 10 (1974Jo11). Eγ=1429.9 3, Iγ=0.13 2 (1973Gi01).
1485.1[#] 5	0.002[#] 1	1525.98	1$^+$	40.847	2$^+$	%Iγ=0.00050 25
1525.9[#] 6	0.022[#] 5	1525.98	1$^+$	0.0	1$^+$	%Iγ=0.0055 13

[†] Weighted averages of values from 1974Jo11, 1973Gi01, 1969Ho01 and 1967An01, when available in the last three references, otherwise from 1974Jo11. Note that in the averaging procedure, 0.2 keV has been added to the values from 1969Ho01 in the energy range of 243 and 394 keV, as these appear systematically lower as compared to the values in other studies.

[‡] Weighted averages of values from 1974Jo11, 1982Gr10, 1973Gi01 and 1969Ho01, when available in the last three references, otherwise from 1974Jo11.

[#] γ from 1974Jo11 only.

[@] γ from the Adopted dataset, not reported in ^{62}Zn ε decay.

[&] From ce data in 1967An01.

[a] For absolute intensity per 100 decays, multiply by 0.251 10.

[b] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[x] γ ray not placed in level scheme.

^{62}Zn $\varepsilon+\beta^+$ decay (9.197 h) 1974Jo11,1973Gi01,1967An01