Coulomb excitation **1980Ku08,1998Si25**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

(p,p′γ):
1980Ku08: E=3.25-4.25 MeV proton beams from the Bhabha Atomic Research Centre, Trombay. γ rays were detected with a Ge(Li) detector. Measured Eγ, Iγ, γ-ray yield, γ(θ). Deduced levels, J, π, γ-ray branching ratios, multipolarities, mixing ratios, transition strengths.
1998Si25: E=2.0-4.5 MeV proton beams from the Variable Energy Cyclotron at Panjab University, Chandigarh. γ rays were detected with a Ge(Li) detector. Measured Eγ, Iγ, γ yield. Deduced levels, γ-ray branching ratios, transition strength.
(α,α′γ):
1956Te26: E=6 MeV. Measured γ-ray yield. Deduced transition strengths.
1972Ro21,1964Ro10: E=4-8 MeV. Measured γ-ray yield, γγ(θ). Deduced levels, J, π, γ-ray transition strengths.
(^{16}O,^{16}O′γ): 1977Do16: E=35 MeV. Measured Eγ, Doppler-shift attenuation. Deduced level, $T_{1/2}$, transition strengths.
1965Es01,1967No04: E=36 MeV. Measured Eγ, Doppler-shift attenuation. Deduced $T_{1/2}$, transition strengths.
1964El03: E=36 MeV. Measured Eγ, γ-ray yields, γ(θ). Deduced transition strengths, γ-ray mixing ratios.
(^{14}N,^{14}N′γ):
1962Er05: E=36 MeV. Measured Eγ, γ-ray yields. Deduced transition strengths.
(^{35}Cl,^{35}Cl′γ):
1973Fi15: E=56-68 MeV. Measured Eγ, Doppler-shift attenuation. Deduced $T_{1/2}$, transition strengths.

^{63}Cu Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0	3/2⁻		
669.8	1/2⁻	0.22 ps *2*	B(E2)↑=0.0116 *6* $T_{1/2}$: average of 0.23 ps *+4−3* (1965Es01), 0.18 ps *2* (1967No04), 0.19 ps *3* (1977Do16), and 0.27 ps *2* (1973Fi15), all using DSAM. Additional information 1. B(E2)↑: weighted average of 0.0113 *8* (1980Ku08), 0.010 *1* (1956Te26), 0.013 *2* (1962Er05), 0.0119 *8* (1964El03), 0.0116 *12* (1964Ro10), and 0.0120 *6* (1998Si25).
962.2	5/2⁻	0.61 ps *4*	B(E2)↑=0.0355 *17* $T_{1/2}$: weighted average of 0.67 ps *6* (1965Es01), 0.57 ps *6* (1967No04), 0.61 ps *6* (1977Do16), and 0.59 ps *4* (1973Fi15), all using DSAM. Other: 0.54 ps *+7−6* from measured B(E2)↑=0.0355 *17* and δ(962γ)=−0.479 *21* from this dataset. Additional information 2. B(E2)↑: weighted average of 0.0343 *24* (1980Ku08), 0.038 *6* (1962Er05), 0.036 *4* (1964El03), 0.0349 *35* (1964Ro10), and 0.0360 *17* (1998Si25).
1327.1	7/2⁻	0.61 ps *6*	B(E2)↑=0.0445 *30* $T_{1/2}$: weighted average of 0.60 ps *8* (1964Ro10), 0.58 ps *6* (1965Es01), and 0.64 ps *6* (1977Do16), all using DSAM. Other: 0.51 ps *4* from measured B(E2)↑=0.0445 *30* and γ branching ratios in this dataset. Additional information 3. B(E2)↑: weighted average of 0.0406 *30* (1980Ku08), 0.053 *11* (1962Er05), 0.057 *5* (1964El03), 0.040 *5* (1964Ro10), and 0.045 *4* (1998Si25).
1412.1	5/2⁻	0.33 ps *+21−11*	B(E2)↑=0.013 *4* $T_{1/2}$: deduced by the evaluator from measured B(E2)↑ and γ branching ratios in this dataset. B(E2)↑: unweighted average of 0.0164 *12* (1980Ku08) and 0.0086 *24* (1998Si25).
1547.1	3/2⁻		B(E2)↑=0.0096 *9* (1980Ku08)
1861.2	7/2⁻		B(E2)↑=0.0115 *15* (1980Ku08)
2012.3			

[†] From a least-squares fit to γ-ray energies, assuming ΔEγ=0.5 keV.
[‡] From Adopted Levels.

Coulomb excitation 1980Ku08,1998Si25 (continued)

$\gamma(^{63}Cu)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	Comments
669.8	$1/2^-$	669.8	100	0.0	$3/2^-$	M1+E2	0.111 *6*	Mult.: from Adopted Gammas. δ: deduced by the evaluator from measured B(E2)↑=0.0116 *6* and $T_{1/2}$=0.22 ps *2*.
962.2	$5/2^-$	962.2	100	0.0	$3/2^-$	M1+E2	−0.479 *21*	Mult.: D+Q from $\gamma(\theta)$ and E1+M2 ruled out by RUL. δ: others: −0.21 *8* (1964El03), −0.41 *+7−11* (1964Ro10), −0.48 *6* (1967No04), and −0.50 *9* (1972Ro21); 0.52 *4* from measured B(E2)↑=0.0355 *17* and $T_{1/2}$=0.61 ps *4* from this dataset.
1327.1	$7/2^-$	365.0	16.8 *5*	962.2	$5/2^-$	M1+E2	−0.060 *5*	I_γ: other: 16 *1* (1980Ku08). Mult.: D+Q from $\gamma(\theta)$ and E1+M2 ruled out by RUL. δ: others: −0.085 *35* from $\gamma(\theta)$ and −0.125 *34* from $\gamma\gamma(\theta)$ in 1972Ro21.
		1327.1	83.2 *8*	0.0	$3/2^-$	[E2]		I_γ: other: 84 *1* (1980Ku08).
1412.1	$5/2^-$	449.9	18.7 *8*	962.2	$5/2^-$	M1+E2	+0.115 *10*	I_γ: other: 22 *1* (1980Ku08). Mult.: D+Q from $\gamma(\theta)$ and E1+M2 ruled out by RUL.
		742.4	4.5 *8*	669.8	$1/2^-$	[E2]		I_γ: other: 5 *1* (1980Ku08).
		1412.1	76.8 *1*	0.0	$3/2^-$	M1+E2	+0.76 *7*	I_γ: other: 73 *1* (1980Ku08). Mult.: D+Q from $\gamma(\theta)$ and E1+M2 ruled out by RUL.
1547.1	$3/2^-$	584.9	20.5 *10*	962.2	$5/2^-$			I_γ: other: 18 *1* (1980Ku08).
		877.2	1.5 *8*	669.8	$1/2^-$			I_γ: other: 2 *1* (1980Ku08).
		1547.1	78.0 *12*	0.0	$3/2^-$	[E2]		I_γ: other: 80 *1* (1980Ku08).
1861.2	$7/2^-$	534.2	3.5 *10*	1327.1	$7/2^-$			
		899.1	41.2 *10*	962.2	$5/2^-$	D+Q	+0.040 *7*	I_γ: other: 41 *1* (1980Ku08).
		1861.1	55.3 *12*	0.0	$3/2^-$	[E2]		I_γ: other: 59 *1* (1980Ku08).
2012.3		1050.1	31	962.2	$5/2^-$			
		1342.5	14	669.8	$1/2^-$			
		2012.3	55	0.0	$3/2^-$			

† From 1998Si25. Intensities are % photon branching from each level.
‡ From $\gamma(\theta)$ in 1980Ku08, unless otherwise noted.

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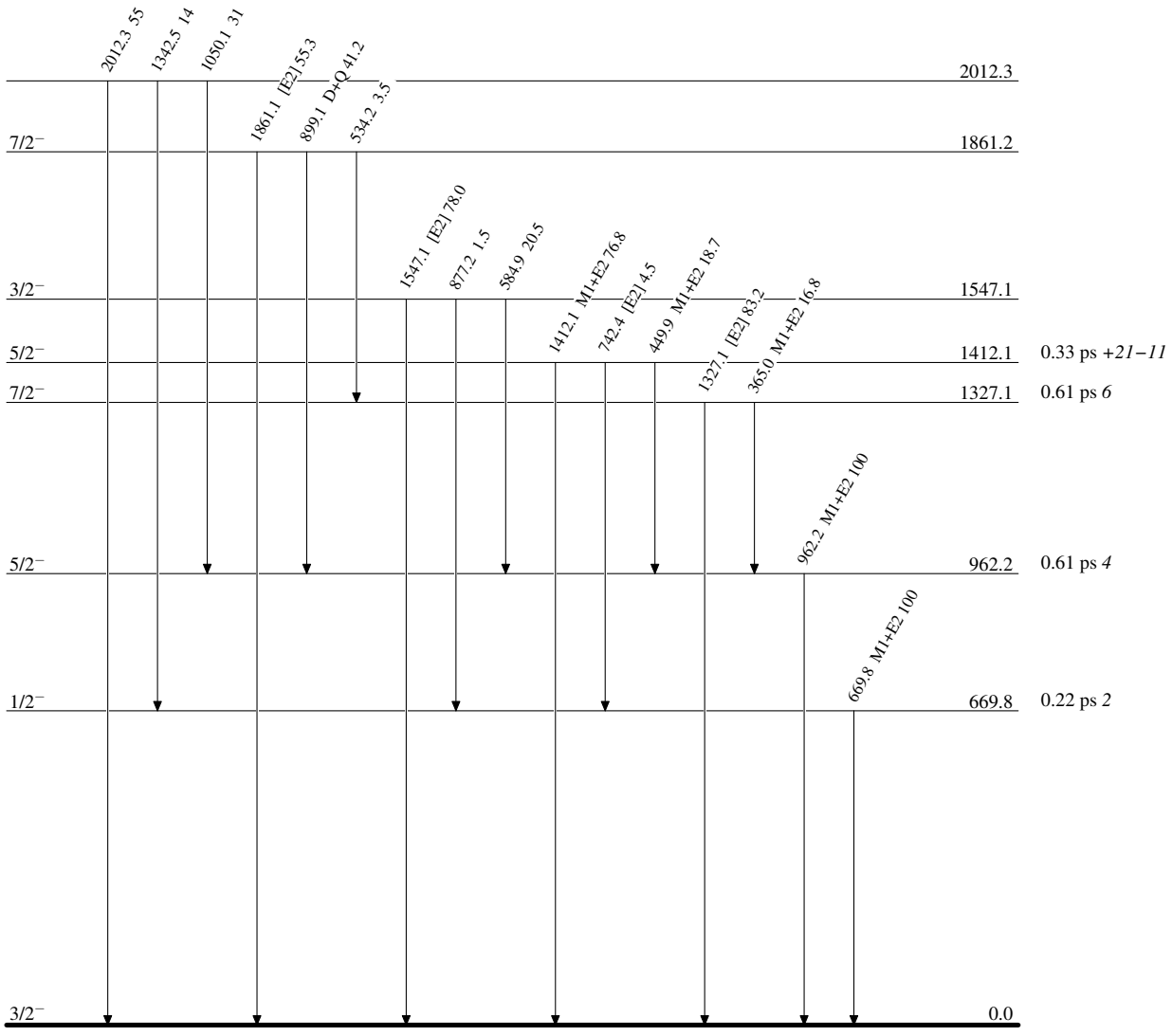
Level Scheme

Intensities: % photon branching from each level



$^{63}_{29}Cu_{34}$