^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 201,1 (2025)	31-Oct-2024

Parent: ^{32}Cl: E=0; $J^\pi=1^+$; $T_{1/2}$=298 ms *1*; Q(ε)=12680.8 *6*; %ε+%β^+ decay=100
^{32}Cl-J^π,$T_{1/2}$: From Adopted Levels of ^{32}Cl.
^{32}Cl-Q($\varepsilon+\beta^+$): From 2021Wa16.
^{32}Cl-%ε+%β^+ decay: %$\varepsilon\alpha$=0.054 *8*, %εp=0.026 *5* (1979Ho27).

2018Ab06: ^{32}Cl source was produced by fragmentation of 150 MeV/nucleon ^{36}Ar beam on a ^{9}Be target at NSCL, purified using the A1900 separator and the Radio Frequency Fragment Separator (RFFS), and implanted into a plastic scintillator. γ rays were detected with the Yale Clovershare Array of nine HPGe detectors with four clover crystals each. Measured Eγ, Iγ, $\beta\gamma$-coin, $\beta\gamma\gamma$-con. Deduced levels, J, π, β-decay and γ emission probabilities, log *ft*, B(GT). Comparisons with shell-model calculations.

2012Me03 (also 2011Me15): ^{32}Cl source was produced by the reaction ^{1}H(^{32}S,n) with a beam energy of 24.8 MeV/nucleon incident on a Liquid N-cooled H_2 gas target at the Cyclotron Institute at Texas A&M University, and implanted into an aluminized Mylar tape. γ particles were detected with a scintillator detector and γ rays were detected with a HPGe detector. Measured Eγ, Iγ, Eβ, Iβ, $\gamma\beta$-coin. Deduced levels, β-decay branching ratios, log *ft* values, B(GT) and B(F) values, isospin symmetry breaking term. Comparison with shell-model calculations.

1979Ho27: ^{32}Cl source was produced via ^{32}S(p,n) with 20 MeV protons from the University of Jyvaskyla MC-20 cyclotron on a natural sulphur target. Charged particles were detected with a Si detector and γ rays were detected with a Ge detector. Measured E(p), I(p), E(α), I(α). Deduced proton and α emission probabilities, β-decay branching ratios, log *ft* of particle-unbound levels.

1973De08: ^{32}Cl source was produce via ^{32}S(p,n) with 27 MeV protons from the University of Colorado cyclotron. γ rays were detected with a Ge(Li) detector. Measured Eγ, Iγ. Deduced levels, β-decay branching ratios, γ-ray emission probabilities and branching ratios. Comparisons with available data.

1968Ar03: ^{32}Cl source was produced via ^{32}S(p,n) with 25 MeV protons from the UCLA sector focused cyclotron. Rabbit system for target transfer to counting area. β particles were detected with a magnetic spectrometer and γ rays were detected with a Ge detector. Measured Eγ, Iγ, decay curve, Kurie plot. Deuced levels, parent $T_{1/2}$, β-decay branching ratios and energies, γ-ray emission probabilities.

Others: 1971Go18, 1969St14, 1966An01.

From RADLIST code, the total released energy is 12700 keV *110* as compared to 12680.8 keV *6* from Q-value (2021Wa16), indicating completeness of this decay scheme.

^{32}S Levels

Isospins are from 2012Me03.
E(p) and E(α) under comments of particle-unbound levels are from 1979Ho27.

E(level)†	J^π‡	Comments
0	0^+	T=0
2230.92 *29*	2^+	T=0
3778.55 *32*	0^+	T=0
4282.12 *33*	2^+	T=0
4695.66 *33*	1^+	T=0
5006.1 *5*	3^-	
5548.59 *34*	2^+	T=0
5799.0 *13*	1^-	
6665.8 *4*	2^+	T=0
7000.9 *4*	1^+	T=1
7114.7 *5*	2^+	T=1
7190.8 *5*	1^+	T=0
7484.6 *15*	2^+	
7535.5 *6*	0^+	T=1
7637	0^+	T=0 Additional information 1.

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^{32}Cl ε+β^+ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

^{32}S Levels (continued)

E(level)†	J$^\pi$‡	Comments
		E(level): rounded value from Adopted Levels. J$^\pi$: 2012Me03 also propose 0$^+$ based on shell-model calculation.
7923.8 *11*	0$^+$	T=0 J$^\pi$: 2012Me03 also propose 0$^+$ based on shell-model calculation.
8126.5 *16*	1$^+$	T=1
8407.9 *15*	2$^+$	
8692 *5*	2$^+$	E(α)=1526 *5*.
8861.1 *16*	2$^+$	E(α)=1673 *5*.
9206.4 *11*	1$^+$	T=1
9231 *5*	1$^-$	E(α)=2201 *5*.
9463 *5*	2$^+$	E(α)=2201 *5*.
9650.3 *12*	2$^+$	E(p)=762 *5*.
9710 *5*	2$^+$	E(α)=2417 *5*.
9887 *5*	(2)$^+$	E(p)=991 *5*.
9949 *5*	0$^+$,1$^+$,2$^+$	E(p)=1051 *5*.
9983 *5*	2	E(α)=2656 *5*.
10231 *5*	1$^+$	E(p)=1324 *5*.
10291 *5*	2$^+$	E(p)=1381 *5*, E(α)=2927 *5*.
10459 *5*	0$^+$	E(α)=3072 *5*.
10531 *5*	2$^+$	E(α)=3135 *5*.
10780 *5*	2$^+$	E(p)=1856 *5*.
10792 *5*	(2)$^+$	E(α)=3364 *5*.
11063 *5*	0$^+$,2$^+$	E(α)=3601 *5*.

† From a least-squares fit to γ-ray energies for levels connected with γ transitions and from E(α) or E(p) for particle-unbound levels (above 8407 level).

‡ From Adopted Levels.

ε,β^+ radiations

M(GT) given under comments are experimental Gamow-Teller matrix element from 2012Me03. It is related to the experimental GT strength B(GT)$_{\text{exp}}$ by B(GT)$_{\text{exp}}$=g$^2_{\text{A,eff}}$×M(GT)^2, where g$^2_{\text{A,eff}}$=1 is taken in 2012Me03.

E(decay)†	E(level)	Iβ^+ #	Iε‡#	Log *ft*	I($\varepsilon+\beta^+$)#	Comments
(1618 *5*)	11063	4×10^{-5} *2*	1.7×10^{-5} *9*	5.4 *+2−3*	0.00006 *3*	av Eβ=241.6 *21*; εK=0.2625 *53*; εL=0.02475 *50*; εM+=3.024×10^{-3} *61* I($\varepsilon+\beta^+$): from %I(p)<2.0×10^{-4}, %I(α)=6×10^{-5} *3* (1979Ho27).
(1889 *5*)	10792	4.6×10^{-4} *9*	6×10^{-5} *1*	5.0 *1*	0.00051 *10*	av Eβ=357.3 *22*; εK=0.0968 *16*; εL=0.00912 *15*; εM+=1.114×10^{-3} *19* I($\varepsilon+\beta^+$): from %I(p)<2.0×10^{-4}, %I(α)=0.00051 *10* (1979Ho27).
(1901 *5*)	10780	0.0014 *3*	1.7×10^{-4} *3*	4.5 *1*	0.0016 *3*	av Eβ=362.5 *22*; εK=0.0930 *16*; εL=0.00876 *15*; εM+=1.071×10^{-3} *18* I($\varepsilon+\beta^+$): from %I(p)=0.0016 *3*, %I(α)<2.0×10^{-4} (1979Ho27).
(2150 *5*)	10531	0.00080 *19*	4.1×10^{-5} *10*	5.2 *1*	0.00084 *20*	av Eβ=471.6 *22*; εK=0.04453 *60*; εL=4.195×10^{-3} *56*; εM+=5.126×10^{-4} *69* I($\varepsilon+\beta^+$): from %I(p)<2.0×10^{-4}, %I(α)=0.00084 *20* (1979Ho27).

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^{32}Cl ε+β^+ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

ϵ,β^+ radiations (continued)

E(decay)†	E(level)	Iβ^+ #	Iε‡#	Log *ft*	I(ε+β^+)#	Comments
(2222 *5*)	10459	2.3×10^{-4} *10*	1.0×10^{-5} *4*	5.9 *2*	0.00024 *10*	av Eβ=503.6 *23*; εK=0.03698 *47*; εL=3.484×10^{-3} *44*; εM+=4.257×10^{-4} *54* I(ε+β^+): from %I(p)<2.0×10^{-4}, %I(α)=2.4×10^{-4} *10* (1979Ho27).
(2390 *5*)	10291	0.0024 *3*	6.9×10^{-5} *8*	5.11 *5*	0.0025 *3*	av Eβ=578.9 *23*; εK=0.02491 *28*; εL=2.346×10^{-3} *26*; εM+=2.867×10^{-4} *32* I(ε+β^+): from %I(p)=0.00078 *20*, %I(α)=0.0017 *3* (1979Ho27).
(2450 *5*)	10231	0.0051 *8*	1.3×10^{-4} *2*	4.9 *1*	0.0052 *8*	av Eβ=606.0 *23*; εK=0.02188 *23*; εL=2.061×10^{-3} *22*; εM+=2.518×10^{-4} *27* I(ε+β^+): from %I(p)=0.0052 *8*, %I(α)<6.0×10^{-5} (1979Ho27).
(2698 *5*)	9983	0.00068 *20*	1.0×10^{-5} *3*	6.0 *1*	0.00069 *20*	av Eβ=719.0 *23*; εK=0.01349 *12*; εL=1.270×10^{-3} *12*; εM+=1.552×10^{-4} *14* I(ε+β^+): from %I(p)<3.0×10^{-4}, %I(α)=0.00069 *20* (1979Ho27).
(2732 *5*)	9949	0.0019 *4*	2.7×10^{-5} *6*	5.6 *1*	0.0019 *4*	av Eβ=734.6 *23*; εK=0.01269 *11*; εL=1.195×10^{-3} *11*; εM+=1.460×10^{-4} *13* I(ε+β^+): from %I(p)=0.0019 *4*, %I(α)<1.0×10^{-4} (1979Ho27).
(2794 *5*)	9887	0.0112 *17*	1.4×10^{-4} *2*	4.9 *1*	0.0113 *17*	av Eβ=763.2 *23*; εK=1.1398×10^{-2} *98*; εL=1.0733×10^{-3} *92*; εM+=1.312×10^{-4} *11* I(ε+β^+): from %I(p)=0.0113 *17*, %I(α)<8.0×10^{-5} (1979Ho27).
(2971 *5*)	9710	0.0040 *7*	3.8×10^{-5} *7*	5.6 *1*	0.0040 *7*	av Eβ=845.1 *23*; εK=8.554×10^{-3} *67*; εL=8.055×10^{-4} *63*; εM+=9.842×10^{-5} *77* I(ε+β^+): from %I(p)<0.0015, %I(α)=0.0040 *7* (1979Ho27).
(3030.5 *17*)	9650.3	0.101 *15*	0.00088 *13*	4.2 *1*	0.102 *15*	av Eβ=872.83 *63*; εK=7.812×10^{-3} *16*; εL=7.355×10^{-4} *15*; εM+=8.987×10^{-5} *18* I(ε+β^+): from 2018Ab06, also including %I(p)=0.0052 *8* and %I(α)<2.0×10^{-4} (1979Ho27), and all other adopted γ transitions that are not observed in their work.
(3218 *5*)	9463	0.030 *4*	2.0×10^{-4} *3*	4.91 *6*	0.030 *4*	av Eβ=960.1 *24*; εK=5.975×10^{-3} *41*; εL=5.625×10^{-4} *39*; εM+=6.874×10^{-5} *47* I(ε+β^+): from %I(p)<5.0×10^{-4}, %I(α)=0.030 *4* (1979Ho27).
(3450 *5*)	9231	2×10^{-4} *1*	1.0×10^{-6} *5*	7.3 *+2−3*	0.0002 *1*	av Eβ=1069.2 *24*; εK=4.421×10^{-3} *28*; εL=4.162×10^{-4} *26*; εM+=5.085×10^{-5} *32* I(ε+β^+): from %I(p)<0.001, %I(α)=2×10^{-4} *1* (1979Ho27).
(3474.4 *16*)	9206.4	0.047 *7*	2.2×10^{-4} *3*	4.9 *1*	0.047 *7*	av Eβ=1080.81 *59*; εK=4.2892×10^{-3} *66*; εL=4.0379×10^{-4} *62*; εM+=4.9338×10^{-5} *76* M(GT)=0.58 *+5−15*. I(ε+β^+): from 2018Ab06, also including all other adopted γ transitions that are not observed in their work. Other: 0.22 *7* from 2012Me03 is discrepant.
(3819.7 *20*)	8861.1	0.061 *11*	2.0×10^{-4} *4*	5.1 *1*	0.061 *11*	av Eβ=1244.55 *81*; εK=2.8924×10^{-3} *53*; εL=2.7226×10^{-4} *50*; εM+=3.3266×10^{-5} *61*

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^{32}Cl ε+β^{+} decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

ε,β^{+} radiations (continued)

E(decay)†	E(level)	Iβ^{+} #	Iε‡#	Log *ft*	I(ε+β^{+})#	Comments
						I(ε+β^{+}): from 2018Ab06, including %I(α)=0.0146 *20* (1979Ho27), %Iγ(8859.8γ)=0.024 *5* from their work, and adopted branching ratios of 3858γ and 6630γ.
(3989 *5*)	8692	0.0011 *2*	3.0$\times10^{-6}$ *5*	6.9 *1*	0.0011 *2*	av Eβ=1325.2 *24*; εK=2.428$\times10^{-3}$ *12*; εL=2.285$\times10^{-4}$ *12*; εM+=2.792$\times10^{-5}$ *14* I(ε+β^{+}): from %I(α)=0.0011 *2* (1979Ho27).
(4272.9 *19*)	8407.9	0.033 *5*	7$\times10^{-5}$ *1*	5.6 *1*	0.033 *5*	av Eβ=1461.29 *78*; εK=1.8483$\times10^{-3}$ *27*; εL=1.7396$\times10^{-4}$ *26*; εM+=2.1256$\times10^{-5}$ *32*
(4554.3 *20*)	8126.5	0.045 *6*	7$\times10^{-5}$ *1*	5.66 *6*	0.045 *6*	av Eβ=1596.71 *83*; εK=1.4436$\times10^{-3}$ *21*; εL=1.3586$\times10^{-4}$ *20*; εM+=1.6600$\times10^{-5}$ *24* M(GT)<0.20.
(4757.0 *16*)	7923.8	0.036 *77*	0.00005 *11*	6.2 *3*	0.036 *77*	av Eβ=1694.59 *61*; εK=1.2229$\times10^{-3}$ *12*; εL=1.1509$\times10^{-4}$ *12*; εM+=1.4062$\times10^{-5}$ *14* M(GT)=0.087 *19*.
(5043.8@ *16*)	7637	<0.028	<3.04$\times10^{-5}$	>6.12	<0.028	av Eβ=1833.49 *29*; εK=9.8157$\times10^{-4}$ *44*; εL=9.2369$\times10^{-5}$ *41*; εM+=1.12860$\times10^{-5}$ *50* M(GT)<0.05.
(5145.3 *13*)	7535.5	0.183 *11*	1.8$\times10^{-4}$ *1*	5.35 *3*	0.183 *11*	av Eβ=1882.75 *41*; εK=9.1154$\times10^{-4}$ *56*; εL=8.5778$\times10^{-5}$ *53*; εM+=1.04806$\times10^{-5}$ *64* M(GT)=0.164 *9*.
(5196.2 *19*)	7484.6	0.064 *6*		5.83 *4*	0.064 *6*	av Eβ=1907.47 *79*; εK=8.789$\times10^{-4}$ *10*; εL=8.2708$\times10^{-5}$ *95*; εM+=1.0106$\times10^{-5}$ *12*
(5490.0 *13*)	7190.8	0.71 *12*	5.6$\times10^{-4}$ *10*	4.9 *1*	0.71 *12*	av Eβ=2050.41 *38*; εK=7.1825$\times10^{-4}$ *37*; εL=6.7585$\times10^{-5}$ *35*; εM+=8.2576$\times10^{-6}$ *43* M(GT)+M(F)=0.250 *10* for this nonanalog transition, contribution from Fermi transition is expected to be significant.
(5566.1 *13*)	7114.7	0.595 *25*	4.49$\times10^{-4}$ *20*	5.03 *2*	0.595 *25*	av Eβ=2087.49 *38*; εK=6.8314$\times10^{-4}$ *35*; εL=6.4280$\times10^{-5}$ *33*; εM+=7.8539$\times10^{-6}$ *40* M(GT)=0.238 *8*.
(5679.9 *12*)	7000.9	22.4 *2*	0.0157 *2*	3.506 *4*	22.4 *2*	av Eβ=2142.99 *35*; εK=6.3480$\times10^{-4}$ *29*; εL=5.9731$\times10^{-5}$ *28*; εM+=7.2981$\times10^{-6}$ *34* E(decay): measured value: 4750 *240* (1968Ar03).
(6015.0 *12*)	6665.8	2.00 *5*	1.14$\times10^{-3}$ *3*	4.70 *1*	2.00 *5*	av Eβ=2306.68 *35*; εK=5.1660$\times10^{-4}$ *22*; εL=4.8606$\times10^{-5}$ *21*; εM+=5.9388$\times10^{-6}$ *26* M(GT)=0.353 *6*.
(6881.8 *18*)	5799.0	0.028 *7*		6.9 *1*	0.028 *7*	av Eβ=2731.69 *70*; εK=3.2140$\times10^{-4}$ *23*; εL=3.0237$\times10^{-5}$ *22*; εM+=3.6944$\times10^{-6}$ *27*
(7132.2 *12*)	5548.59	3.94 *16*	1.24$\times10^{-3}$ *5*	4.81 *2*	3.94 *16*	av Eβ=2854.82 *34*; εK=2.83906$\times10^{-4}$ *95*; εL=2.67095$\times10^{-5}$ *89*; εM+=3.2634$\times10^{-6}$ *11* E(decay): measured value: 6180 *580* (1968Ar03).
(7674.7 *13*)	5006.1	0.041 *14*		7.0 *2*	0.041 *14*	av Eβ=3122.00 *39*; εK=2.20635$\times10^{-4}$ *77*; εL=2.07562$\times10^{-5}$ *72*; εM+=2.53598$\times10^{-6}$ *88*
(7985.1 *12*)	4695.66	6.03 *9*	1.29$\times10^{-3}$ *2*	4.89 *1*	6.03 *9*	av Eβ=3275.13 *34*; εK=1.92735$\times10^{-4}$ *56*; εL=1.81310$\times10^{-5}$ *53*; εM+=2.21524$\times10^{-6}$

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^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

ϵ,β^+ radiations (continued)

E(decay)†	E(level)	Iβ^+ #	Iε‡#	Log *ft*	I($\varepsilon+\beta^+$)#	Comments
						65 M(GT)=0.281 *2*.
(8398.7 *12*)	4282.12	2.30 *7*	4.1×10^{-4} *1*	5.43 *1*	2.30 *7*	av Eβ=3479.34 *34*; εK=1.62435×10^{-4} *45*; εL=1.52802×10^{-5} *42*; εM+=1.86692×10^{-6} *51* E(decay): measured value: 7480 *260* for decays to 4282 and 4697 (1968Ar03). M(GT)=0.145 *3*.
(8902.3 *12*)	3778.55	1.09 *8*	1.6×10^{-4} *1*	5.89 *3*	1.09 *8*	av Eβ=3729.85 *34*; εK=1.33598×10^{-4} *34*; εL=1.25672×10^{-5} *32*; εM+=1.53544×10^{-6} *39* E(decay): measured value: 9470 *30* (1968Ar03). M(GT)=0.083 *3*.
(10449.9 *12*)	2230.92	59.4 *6*	5.15×10^{-3} *7*	4.520 *5*	59.4 *6*	av Eβ=4496.58 *33*; εK=7.8480×10^{-5} *17*; εL=7.3818×10^{-6} *16*; εM+=9.0189×10^{-7} *19* M(GT)=0.423 *1*.
(12680.8 *16*)	0	1.0 *4*		6.7 *2*	1.0 *4*	av Eβ=5604.77 *30*; εK=4.17673×10^{-5} *64*; εL=3.92834×10^{-6} *60*; εM+=4.79952×10^{-7} *74* E(decay): measured value: 11600 *300* (1968Ar03). Iβ^+: from 1968Ar03. M(GT)=0.035 *+3−10*.

† From 1968Ar03.

‡ From γ intensity balance at each level for excited levels, also including %I(p) and %I(α) from 1979Ho27 as given under comments for particle-unbound levels above 8407 level, unless otherwise noted.

Absolute intensity per 100 decays.

@ Existence of this branch is questionable.

γ(^{32}S)

E$_\gamma$†	I$_\gamma$†‡	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Comments
542#	<0.009	5548.59	2$^+$	5006.1	3$^-$	
726#	<0.012	5006.1	3$^-$	4282.12	2$^+$	
852.3 *6*	0.019 *7*	5548.59	2$^+$	4695.66	1$^+$	E$_\gamma$: weighted average of 851.8 *5* (2012Me03) and 852.9 *6* (2018Ab06). I$_\gamma$: weighted average of 0.027 *8* (2012Me03) and 0.014 *6* (2018Ab06).
916.0 *5*	0.024 *7*	4695.66	1$^+$	3778.55	0$^+$	E$_\gamma$: weighted average of 915.8 *5* (2012Me03) and 916.8 *10* (2018Ab06). I$_\gamma$: weighted average of 0.034 *9* (2012Me03) and 0.019 *6* (2018Ab06).
1229#	<0.015	5006.1	3$^-$	3778.55	0$^+$	
1266.2 *6*	0.022 *9*	5548.59	2$^+$	4282.12	2$^+$	E$_\gamma$: weighted average of 1265.7 *6* (2012Me03) and 1266.9 *7* (2018Ab06). I$_\gamma$: other: <0.036 *13* (2012Me03).
1452.0 *4*	0.249 *20*	7000.9	1$^+$	5548.59	2$^+$	E$_\gamma$: weighted average of 1451.8 *4* (2012Me03) and 1452.2 *4* (2018Ab06). I$_\gamma$: weighted average of 0.276 *19* (2012Me03) and 0.235 *14* (2018Ab06).
1547.1 *4*	3.16 *4*	3778.55	0$^+$	2230.92	2$^+$	E$_\gamma$: from 2012Me03. Others: 1545.9 *20* (1968Ar03) and 1548 *2* (1973De08). I$_\gamma$: from 2012Me03. Others: 5.1 *26* (1966An01), 5 *3* (1968Ar03), and 3.6 *6* (1973De08). Additional information 3.
1659.9 *5*	0.040 *11*	6665.8	2$^+$	5006.1	3$^-$	
1769.7 *4*	0.127 *13*	5548.59	2$^+$	3778.55	0$^+$	E$_\gamma$: weighted average of 1769.6 *4* (2012Me03) and 1769.8 *4* (2018Ab06). I$_\gamma$: weighted average of 0.136 *26* (2012Me03) and 0.125 *13* (2018Ab06).

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^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

$\gamma(^{32}S)$ (continued)

E_γ[†]	I_γ[†‡]	E_i(level)	J^π_i	E_f	J^π_f	Comments
1970.1 *5*	0.137 *19*	6665.8	2^+	4695.66	1^+	E_γ: weighted average of 1969.3 *6* (2012Me03) and 1970.4 *4* (2018Ab06). I_γ: weighted average of 0.15 *4* (2012Me03) and 0.134 *19* (2018Ab06).
2050.9 *4*	0.433 *24*	4282.12	2^+	2230.92	2^+	E_γ: weighted average of 2050.7 *4* (2012Me03) and 2051.0 *4* (2018Ab06). I_γ: weighted average of 0.47 *4* (2012Me03) and 0.419 *24* (2018Ab06).
2107[#]	<0.010	7114.7	2^+	5006.1	3^-	
2183[#]	<0.010	7190.8	1^+	5006.1	3^-	
2230.2 *4*	91.9 *5*	2230.92	2^+	0	0^+	E_γ: from 2012Me03. Others: 2230.4 *16* (1968Ar03) and 2230.5 *15* (1973De08). I_γ: from 2012Me03. Others: 96 *4* (1966An01), 89 *6* (1968Ar03), and 92 *4* (1973De08). Additional information 2.
2305.2 *5*	0.154 *9*	7000.9	1^+	4695.66	1^+	E_γ: from 2012Me03. Other: 2305.2 *5* (2018Ab06). I_γ: weighted average of 0.137 *23* (2012Me03) and 0.157 *9* (2018Ab06).
2383.5 *5*	0.060 *7*	6665.8	2^+	4282.12	2^+	E_γ: weighted average of 2383.3 *5* (2012Me03) and 2383.6 *5* (2018Ab06). I_γ: weighted average of 0.077 *20* (2012Me03) and 0.058 *7* (2018Ab06). Additional information 5.
2418.1 *5*	0.062 *9*	7114.7	2^+	4695.66	1^+	E_γ: weighted average of 2417.7 *6* (2012Me03) and 2418.3 *5* (2018Ab06). I_γ: weighted average of 0.057 *14* (2012Me03) and 0.064 *9* (2018Ab06). Additional information 11.
2464.3 *5*	4.19 *7*	4695.66	1^+	2230.92	2^+	E_γ: weighted average of 2464.1 *17* (1968Ar03), 2463.8 *10* (1973De08), and 2464.4 *5* (2012Me03). I_γ: weighted average of 6.9 *21* (1966An01), 5.0 *25* (1968Ar03), 4.0 *4* (1973De08), 4.24 *5* (2012Me03), and 3.92 *12* (2018Ab06).
2480[#]	<0.070	7484.6	2^+	5006.1	3^-	
2494.5 *9*	0.011 *7*	7190.8	1^+	4695.66	1^+	E_γ: weighted average of 2495.2 *23* (2012Me03) and 2494.4 *9* (2018Ab06). I_γ: weighted average of 0.016 *14* (2012Me03) and 0.010 *7* (2018Ab06).
2718.9 *5*	0.502 *31*	7000.9	1^+	4282.12	2^+	E_γ: weighted average of 2719.0 *5* (2012Me03) and 2718.8 *5* (2018Ab06). I_γ: unweighted average of 0.533 *22* (2012Me03) and 0.471 *17* (2018Ab06). Additional information 8.
2775.2 *5*	0.081 *9*	5006.1	3^-	2230.92	2^+	
2831.4 *9*	0.021 *8*	7114.7	2^+	4282.12	2^+	E_γ: weighted average of 2832.4 *15* (2012Me03) and 2831.0 *9* (2018Ab06). I_γ: weighted average of 0.019 *13* (2012Me03) and 0.022 *8* (2018Ab06).
2839.7 *5*	0.183 *11*	7535.5	0^+	4695.66	1^+	E_γ: from 2012Me03. Other: 2839.7 *5* (2018Ab06). I_γ: from 2018Ab06. Other: 0.185 *18* (2012Me03).
2886.9 *5*	0.976 *27*	6665.8	2^+	3778.55	0^+	E_γ: weighted average of 2885 *2* (1973De08) and 2887.0 *5* (2012Me03). I_γ: from 2012Me03. Other: 1.0 *4* (1973De08). Additional information 6.
2911[#]	<0.030	7190.8	1^+	4282.12	2^+	I_γ: 2012Me03 give branching ratio<3.4.
3120[#]	<0.015	8126.5	1^+	5006.1	3^-	
3203[#]	<0.006	7484.6	2^+	4282.12	2^+	
3222.3 *6*	0.823 *59*	7000.9	1^+	3778.55	0^+	E_γ: weighted average of 3222.4 *6* (2012Me03) and 3222.1 *6* (2018Ab06). I_γ: unweighted average of 0.881 *28* (2012Me03) and 0.764 *25* (2018Ab06). Additional information 9.
3317.9 *6*	2.47 *5*	5548.59	2^+	2230.92	2^+	E_γ: from 2012Me03. Others: 3319 *2* (1968Ar03) and 3317.5 *15*

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^{32}Cl ε+β^+ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

γ(^{32}S) (continued)

E$_\gamma$[†]	I$_\gamma$[†‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	I$_{(\gamma+ce)}$[‡]	Comments
								(1973De08). I$_\gamma$: weighted average of 4.1 *18* (1966An01), 4 *1* (1968Ar03), 2.5 *4* (1973De08), and 2.46 *5* (2012Me03).
3339.2 *8*	0.027 *9*	7114.7	2^+	3778.55	0^+			E$_\gamma$: weighted average of 3339.7 *12* (2012Me03) and 3339.0 *8* (2018Ab06). I$_\gamma$: weighted average of 0.037 *15* (2012Me03) and 0.024 *9* (2018Ab06).
3355[#]	<0.028	7637	0^+	4282.12	2^+			
3400[#]	<0.012	8407.9	2^+	5006.1	3^-			
3412.4 *7*	0.141 *12*	7190.8	1^+	3778.55	0^+			E$_\gamma$: weighted average of 3412.2 *7* (2012Me03) and 3412.5 *7* (2018Ab06). I$_\gamma$: weighted average of 0.122 *19* (2012Me03) and 0.148 *12* (2018Ab06).
3714[#]	<0.045	8407.9	2^+	4695.66	1^+			
3779.5 *8*		3778.55	0^+	0	0^+	[E0]	0.044 *18*	E$_\gamma$: weighted average of 3777 *4* (2012Me03) and 3779.6 *8* (2018Ab06). I$_{(\gamma+ce)}$: other: 0.044 *25* (2012Me03).
3858[#]	<0.013	8861.1	2^+	5006.1	3^-			
4101[#]	<0.038	9650.3	2^+	5548.59	2^+			
4126[#]	<0.016	8407.9	2^+	4282.12	2^+			
4281.7 *7*	2.47 *6*	4282.12	2^+	0	0^+			E$_\gamma$: weighted average of 4279.6 *20* (1968Ar03), 4281.5 *15* (1973De08), and 4282.0 *7* (2012Me03). I$_\gamma$: weighted average of 2.1 *11* (1966An01), 4 *2* (1968Ar03), 2.6 *1* (1973De08), and 2.42 *6* (2012Me03). I$_\gamma$: 2012Me03 give branching ratio of 83.5 *11*; 1.1 (stat), +0.3−0.1 (syst).
4435.0 *8*	0.75 *3*	6665.8	2^+	2230.92	2^+			E$_\gamma$: weighted average of 4433 *2* (1973De08), 4435.5 *8* (2012Me03), and 4434.8 *8* (2018Ab06). I$_\gamma$: weighted average of 0.8 *2* (1973De08), 0.83 *6* (2012Me03), and 0.73 *3* (2018Ab06).
4625[#]	<0.052	8407.9	2^+	3778.55	0^+			
4643[#]	<0.015	9650.3	2^+	5006.1	3^-			
4695.3 *8*	2.42 *5*	4695.66	1^+	0	0^+			E$_\gamma$: weighted average of 4694.3 *20* (1968Ar03), 4694 *2* (1973De08), and 4695.6 *8* (2012Me03). I$_\gamma$: from 2012Me03. Others: 4 *3* (1968Ar03) and 2.8 *6* (1973De08).
4770.0 *8*	20.62 *19*	7000.9	1^+	2230.92	2^+			E$_\gamma$: weighted average of 4767.6 *16* (1968Ar03), 4770.0 *15* (1973De08), 4770.8 *8* (2012Me03), and 4769.8 *9* (2018Ab06). I$_\gamma$: from 2012Me03. Others: 20.5 *23* (1966An01), 25 *4* (1968Ar03), and 20.5 *20* (1973De08). Additional information 10.
4883.2 *8*	0.485 *20*	7114.7	2^+	2230.92	2^+			E$_\gamma$: weighted average of 4881 *4* (1973De08), 4883.7 *8* (2012Me03), and 4882.7 *9* (2018Ab06). I$_\gamma$: weighted average of 0.504 *32* (2012Me03) and 0.477 *20* (2018Ab06). Other: 0.45 *20* (1973De08). Additional information 12.
4954.2 *11*	0.038 *8*	9650.3	2^+	4695.66	1^+			
4959.2 *8*	0.268 *18*	7190.8	1^+	2230.92	2^+			E$_\gamma$: weighted average of 4959.6 *8* (2012Me03) and

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^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27 (continued)

$\gamma(^{32}S)$ (continued)

E_γ[†]	I_γ[†‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						4958.7 *9* (2018Ab06). I_γ: weighted average of 0.32 *4* (2012Me03) and 0.262 *14* (2018Ab06).
5304[#]	<0.031	7535.5	0^+	2230.92	2^+	
5368[#]	<0.018	9650.3	2^+	4282.12	2^+	
5548.9 *9*	1.55 *15*	5548.59	2^+	0	0^+	E_γ: from 2012Me03. Others: 5548 *2* (1968Ar03) and 5549.5 *20* (1973De08). I_γ: weighted average of 1.5 *10* (1966An01), 3.0 *5* (1968Ar03), 1.6 *3* (1973De08), and 1.50 *9* (2012Me03). Additional information 4.
5692.3 *11*	0.036 *7*	7923.8	0^+	2230.92	2^+	E_γ: weighted average of 5693.3 *13* (2012Me03) and 5691.6 *11* (2018Ab06). I_γ: weighted average of 0.033 *14* (2012Me03) and 0.037 *7* (2018Ab06). Additional information 14.
5798.4 *13*	0.028 *7*	5799.0	1^-	0	0^+	
5871[#]	<0.004	9650.3	2^+	3778.55	0^+	
5895[#]	<0.015	8126.5	1^+	2230.92	2^+	
6630[#]	<0.012	8861.1	2^+	2230.92	2^+	
6665.2 *16*	0.037 *7*	6665.8	2^+	0	0^+	E_γ: weighted average of 6665.8 *21* (2012Me03) and 6664.9 *16* (2018Ab06). I_γ: weighted average of 0.048 *19* (2012Me03) and 0.036 *7* (2018Ab06). Additional information 7.
6973.5 *13*	0.057 *42*	9206.4	1^+	2230.92	2^+	E_γ: from 2012Me03. Other: 6973.3 *15* (2018Ab06). I_γ: unweighted average of 0.098 *18* (2012Me03) and 0.015 *4* (2018Ab06).
7001.0 *15*	0.055 *7*	7000.9	1^+	0	0^+	E_γ: weighted average of 7001.4 *16* (2012Me03) and 7000.6 *15* (2018Ab06). I_γ: weighted average of 0.057 *16* (2012Me03) and 0.054 *7* (2018Ab06).
7115[#]	<0.020	7114.7	2^+	0	0^+	
7190.4 *15*	0.169 *22*	7190.8	1^+	0	0^+	E_γ: weighted average of 7194 *3* (1973De08) and 7189.8 *12* (2012Me03). I_γ: from 2012Me03. Other: 0.41 *10* (1973De08) is discrepant. Additional information 13.
7419[#]		9650.3	2^+	2230.92	2^+	
7483.7 *15*	0.064 *6*	7484.6	2^+	0	0^+	
7534[#]	<0.042	7535.5	0^+	0	0^+	
8125.4 *16*	0.045 *6*	8126.5	1^+	0	0^+	
8406.7 *15*	0.033 *5*	8407.9	2^+	0	0^+	
8859.8 *16*	0.024 *5*	8861.1	2^+	0	0^+	
9207.3 *19*	0.016 *5*	9206.4	1^+	0	0^+	

[†] From 2018Ab06, unless otherwise noted.

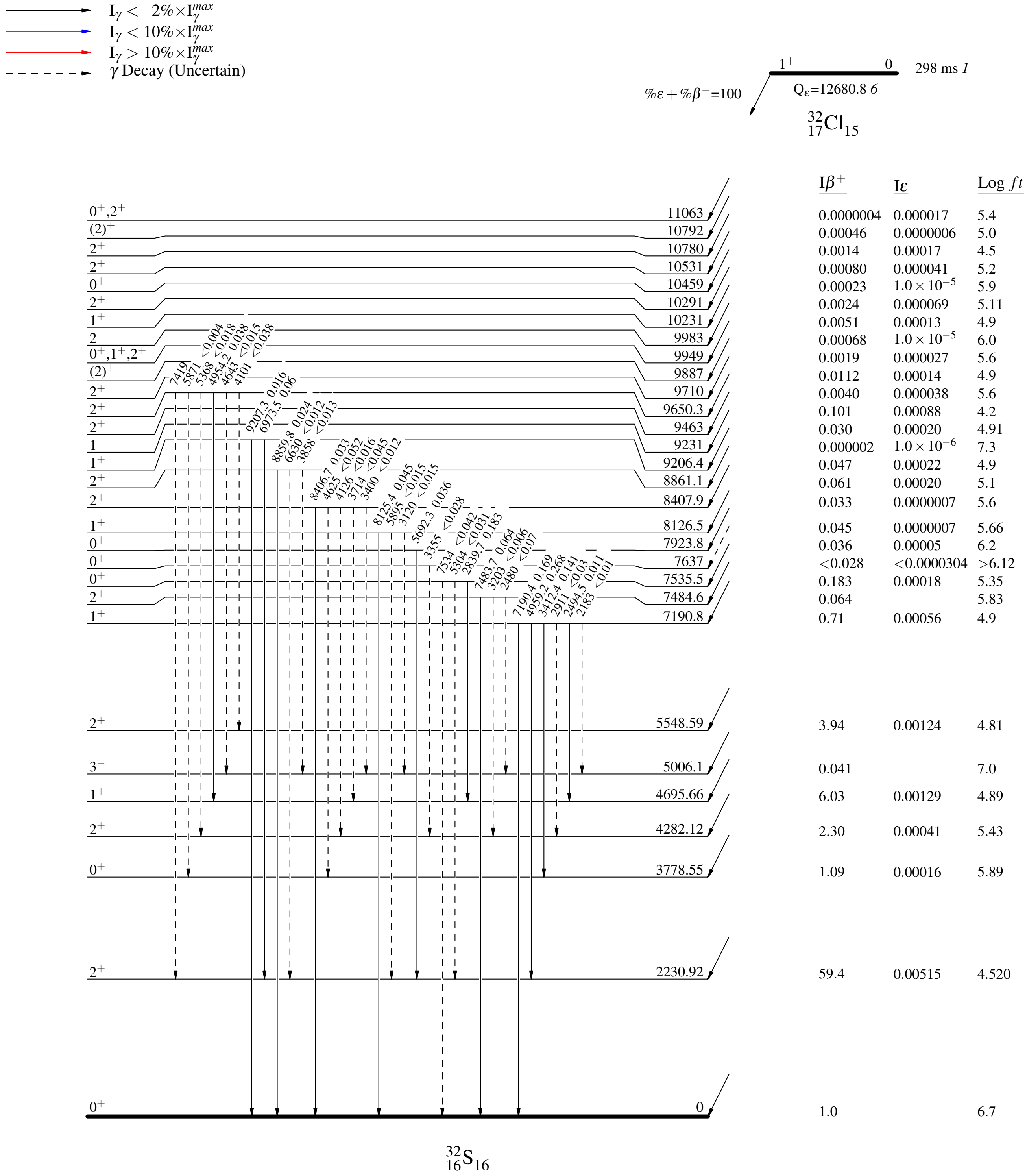
[‡] Absolute intensity per 100 decays.

[#] Placement of transition in the level scheme is uncertain.

^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



		$I\beta^+$	$I\varepsilon$	Log ft
$0^+,2^+$	11063	0.0000004	0.000017	5.4
$(2)^+$	10792	0.00046	0.0000006	5.0
2^+	10780	0.0014	0.00017	4.5
2^+	10531	0.00080	0.000041	5.2
0^+	10459	0.00023	1.0×10^{-5}	5.9
2^+	10291	0.0024	0.000069	5.11
1^+	10231	0.0051	0.00013	4.9
2	9983	0.00068	1.0×10^{-5}	6.0
$0^+,1^+,2^+$	9949	0.0019	0.000027	5.6
$(2)^+$	9887	0.0112	0.00014	4.9
2^+	9710	0.0040	0.000038	5.6
2^+	9650.3	0.101	0.00088	4.2
2^+	9463	0.030	0.00020	4.91
1^-	9231	0.000002	1.0×10^{-6}	7.3
1^+	9206.4	0.047	0.00022	4.9
2^+	8861.1	0.061	0.00020	5.1
2^+	8407.9	0.033	0.0000007	5.6
1^+	8126.5	0.045	0.0000007	5.66
0^+	7923.8	0.036	0.00005	6.2
0^+	7637	<0.028	<0.0000304	>6.12
0^+	7535.5	0.183	0.00018	5.35
2^+	7484.6	0.064		5.83
1^+	7190.8	0.71	0.00056	4.9
2^+	5548.59	3.94	0.00124	4.81
3^-	5006.1	0.041		7.0
1^+	4695.66	6.03	0.00129	4.89
2^+	4282.12	2.30	0.00041	5.43
0^+	3778.55	1.09	0.00016	5.89
2^+	2230.92	59.4	0.00515	4.520
0^+	0	1.0		6.7

^{32}Cl $\varepsilon+\beta^+$ decay (298 ms) 2018Ab06,2012Me03,1979Ho27

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays