^{33}Cl ε decay (2.511 s) 1980Wi13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 112, 1393 (2011)	31-Mar-2011

Parent: ^{33}Cl: E=0; $J^\pi=3/2^+$; $T_{1/2}=2.511$ s *3*; Q(ε)=5582.59 *44*; %ε+%β^+ decay=100.0

^{33}Cl-Q(ε): from 2009AuZZ. Other: 5582.6 *4* (2003Au03).

1980Wi13: ^{33}Cl produced by ^{32}(d,n)^{33}Cl reaction with 11.0 MeV deuterons on natural sulphur target. Ge(Li) detector. Measured Eγ, Iγ. Deduced levels, Iβ.

1987Bo21: Measured Eγ from ^{33}Ar β^+ decay product.

Half-life measurements: 1958Mu05, 1960Ja12, 1970Sc16, 1972Es02, 1973Ta04, 1977Az01. Others: 1940-Hoag: Phys Rev 57, 937; 1941Wh02; 1948Sc20; 1951Bo56; 1954Ty33; 1960Wa04; 1962Va27; 1970Ba65.

Older γ ray measurements: 1953Meyerhof: Phys Rev 93, 949; 1953Nahmias: Compt Rendu 236, 2399.

β measurements: 1941Wh02; 1951Bo56; 1953Nahmias: Compt Rendu 236, 2399; 1960Wa04; 1962Va27.

^{33}S Levels

E(level)	J^π‡	E(level)	J^π‡	E(level)	J^π‡	E(level)	J^π‡
0	$3/2^+$	2312.7 *7*	$3/2^+$	3935.2 *8*	$3/2^+$	4375.5 *8*	$1/2^+$
840.9† *5*	$1/2^+$	2867.5† *7*	$5/2^+$	4053.2 *8*	$1/2^+$	4424.7 *8*	$(1/2^+,3/2)$
1966.6† *7*	$5/2^+$	3832.0 *8*	$5/2^+$	4144.3 *10*	$(3/2^+,5/2)$	4746.3 *8*	$(1/2,3/2,5/2^+)$

† From Eγ in 1987Bo21.

‡ From Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(836.3 *9*)	4746.3		0.000041 *12*	5.35 *13*	0.000041 *12*	εK=0.9041; εL=0.08546; εM+=0.01045
(1157.9 *9*)	4424.7	$<6.7\times10^{-7}$	$<5.6\times10^{-5}$	>5.5	<0.000057	av Eβ=56.40 *36*; εK=0.8935 *3*; εL=0.08434 *3*; εM+=0.010307 *4*
(1207.1 *9*)	4375.5	$<1.6\times10^{-6}$	$<4.2\times10^{-5}$	>5.7	<0.000044	av Eβ=75.80 *36*; εK=0.8705 *6*; εL=0.08215 *6*; εM+=0.010040 *7*
(1438.3 *11*)	4144.3	$<1.1\times10^{-5}$	$<1.5\times10^{-5}$	>6.3	<0.000026	av Eβ=168.40 *45*; εK=0.5255 *20*; εL=0.04956 *19*; εM+=0.006057 *23*
(1529.4 *9*)	4053.2	2.8×10^{-5} *9*	1.9×10^{-5} *6*	6.20 *14*	0.000047 *15*	av Eβ=205.78 *38*; εK=0.3736 *14*; εL=0.03523 *13*; εM+=0.004305 *16*
(1647.4 *9*)	3935.2	$<5.\times10^{-5}$	$<2.\times10^{-5}$	>6.3	<0.00007	av Eβ=254.95 *39*; εK=0.2338 *9*; εL=0.02204 *8*; εM+=0.002693 *10*
(1750.6 *9*)	3832.0	$<7.6\times10^{-5}$	$<1.6\times10^{-5}$	>6.4	<0.000092	av Eβ=298.59 *39*; εK=0.1573 *6*; εL=0.01483 *5*; εM+=0.001812 *7*
(2715.1 *8*)	2867.5	0.43 *6*	0.0064 *9*	4.18 *6*	0.44 *6*	av Eβ=727.61 *38*; εK=0.013058 *20*; εL=0.0012297 *1*; εM+=0.00015026
(3269.9 *8*)	2312.7	0.035 *5*	0.00022 *3*	5.82 *7*	0.035 *5*	av Eβ=985.24 *39*; εK=0.005560 *7*; εL=0.0005234 *6*; εM+=6.396×10^{-5} *7*
(3616.0 *8*)	1966.6	0.46 *6*	0.0018 *2*	4.97 *6*	0.46 *6*	av Eβ=1148.53 *40*; εK=0.003619 *4*; εL=0.0003407 *4*; εM+=4.163×10^{-5} *4*
(4741.7 *7*)	840.9	0.48 *6*	0.00066 *8*	5.65 *6*	0.48 *6*	av Eβ=1688.11 *33*; εK=0.0012356 *7*; εL=0.000116; εM+=1.4208×10^{-5} *8*
(5582.6 *5*)	0	98.51 *19*	0.0735 *7*	3.7471 *10*	98.58 *19*	av Eβ=2096.49 *22*; εK=0.0006745 *2*; εL=6.347×10^{-5} *2*; εM+=7.755×10^{-6} *3*

† Absolute intensity per 100 decays.

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γ(^{33}S)

Iγ normalization: From summed γ intensity to g.s.=1.42 *19*.

E_γ [†]	I_γ [‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]
840.4 *9*	119 *4*	840.9	$1/2^+$	0	$3/2^+$	M1+E2	+0.18 *5*
1125	1.4 *3*	1966.6	$5/2^+$	840.9	$1/2^+$	E2	
1472	5.8 *3*	2312.7	$3/2^+$	840.9	$1/2^+$	M1+E2	−0.12 *10*
1519	<0.52	3832.0	$5/2^+$	2312.7	$3/2^+$		
1967.3 *9*	104.2 *16*	1966.6	$5/2^+$	0	$3/2^+$	M1+E2	−0.60 *12*
2026	1.54 *19*	2867.5	$5/2^+$	840.9	$1/2^+$	E2	
2312	2.31 *14*	2312.7	$3/2^+$	0	$3/2^+$	M1+E2	−0.28 *7*
2409	<0.36	4375.5	$1/2^+$	1966.6	$5/2^+$		
2867.7 *9*	100.0 *18*	2867.5	$5/2^+$	0	$3/2^+$	M1+E2	+0.12 *4*
3094	<0.3	3935.2	$3/2^+$	840.9	$1/2^+$		
3212	<0.13	4053.2	$1/2^+$	840.9	$1/2^+$		
3584	<0.09	4424.7	$(1/2^+,3/2)$	840.9	$1/2^+$		
3832	<0.12	3832.0	$5/2^+$	0	$3/2^+$		
3905	<0.068	4746.3	$(1/2,3/2,5/2^+)$	840.9	$1/2^+$		
3935	<0.095	3935.2	$3/2^+$	0	$3/2^+$		
4053	0.11 *3*	4053.2	$1/2^+$	0	$3/2^+$		
4144	<0.058	4144.3	$(3/2^+,5/2)$	0	$3/2^+$		
4375	<0.099	4375.5	$1/2^+$	0	$3/2^+$		
4424	<0.067	4424.7	$(1/2^+,3/2)$	0	$3/2^+$		
4746	0.085 *23*	4746.3	$(1/2,3/2,5/2^+)$	0	$3/2^+$		

[†] Values with uncertainties from 1987Bo21 and others are from level difference.
[‡] From 1980Wi13.
[#] From Adopted Gammas.
[@] For absolute intensity per 100 decays, multiply by 0.0044 *7*.

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Decay Scheme

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