^{119}Te ε decay (4.70 d) 1977Ya03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. M. Symochko, E. Browne, J. K. Tuli	NDS 110,2945 (2009)	1-Dec-2008

Parent: ^{119}Te: E=260.96 *5*; J^{π}=11/2$^-$; $T_{1/2}$=4.70 d *4*; Q(ε)=2293.0 *20*; %ε+%β^+ decay=100.0

Additional information 1.

1977Ya03: ^{118}Sn(α,3n) E(α)=44 MeV, chem; semi γ, $\gamma\gamma$, $\gamma\gamma(\theta)$; mag spect ce.

1975Du04: Sn(α,xn) E(α)=54 MeV, mass separation; semi, scin γ, $\gamma\gamma$, γX(t).

1967Gr14: ^{116}Sn(α,n) E<18 MeV; chem; semi, scin γ, ce, $\gamma\gamma$, $\gamma\gamma(\theta)$.

The decay scheme is that proposed by 1977Ya03, except as noted. It is similar to those proposed by 1975Du04, 1967Be04, 1967Gr14.

Others: γ(1977Be52,1969Ga08,1967Si14,1967Ka22,1963Ka04,1960Ko12);
ce (1969Ga08,1967Si14,1963Sv01,1960Ko12,1982Sa22);
$\gamma\gamma(\theta)$ (1982Sa22,1967Be47,1967Be04,1967Si14);
$\gamma\gamma$ (1967Gr14,1967Ka22,1963Ka04,1960Ko12);
$\gamma\beta$+ (1963Ka04);
γce (1963Sv01);
β^+ (1960Ko12)

^{119}Sb Levels

E(level)†	J^{π}‡	$T_{1/2}$‡	Comments
0	5/2$^+$	38.19 h *22*	
270.54 *4*	7/2$^+$	35 ps *10*	$T_{1/2}$: 35 ps *10* from (2089.57γ)(270.54γ)(t) (1975Du04).
970.90 *5*	9/2$^+$		
1048.42 *5*	7/2$^+$		
1212.75 *4*	9/2$^+$	5.2 ps *48*	$T_{1/2}$: <10 ps from (1212.7γ)(153.5γ)(t) and (x)(1212.7γ)(t) (1975Du04).
1249.74 *5*	9/2$^+$		
1366.34 *4*	11/2$^-$	112 ps *15*	$T_{1/2}$: 112 ps *15* from (153.59γ)(x)(t) and (1212.73γ)(x)(t) (1975Du04).
1407.33 *7*	11/2$^+$		
2129.82 *11*	9/2$^-$		
2226.06 *6*	11/2$^-$		
2278.92 *6*	13/2$^-$		
2283.8 *4*	9/2$^-$		
2360.22 *9*	9/2$^-$		
2379.55 *9*	(9/2,13/2)		

† Deduced by evaluators from a least-squares fit to γ-ray energies.

‡ From Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(174.4 *20*)	2379.55		1.0 *6*	6.4 *3*	1.0 *6*	εK=0.8154; εL=0.1452 *5*; εM+=0.03935 *16*
(193.7 *20*)	2360.22		4.9 *1*	5.857 *15*	4.9 *1*	εK=0.8210; εL=0.1410 *4*; εM+=0.03804 *13*
(270.2 *21*)	2283.8		0.32 *2*	7.37 *3*	0.32 *2*	εK=0.8340; εL=0.13103 *19*; εM+=0.03496 *6*
(275.0 *20*)	2278.92		6.6 *1*	6.072 *11*	6.6 *1*	εK=0.8346; εL=0.13061 *17*; εM+=0.03483 *6*
(327.9 *20*)	2226.06		4.7 *4*	6.39 *4*	4.7 *4*	εK=0.8394; εL=0.1269; εM+=0.03370 *4*
(424.1 *20*)	2129.82		1.8 *1*	7.044 *25*	1.8 *1*	εK=0.8447; εL=0.1228; εM+=0.03243
(1146.6 *20*)	1407.33		7.0 *1*	7.354 *8*	7.0 *1*	εK=0.8554; εL=0.1147; εM+=0.02994
(1187.6 *20*)	1366.34	0.0062 *5*	67 *3*	6.404 *20*	67 *3*	av Eβ=82.9 *10*; εK=0.8555; εL=0.1145; εM+=0.02989
(1583.1 *20*)	970.90	0.0043 *11*	0.28 *7*	9.04 *11*	0.28 *7*	av Eβ=256.8 *9*; εK=0.8440; εL=0.1117; εM+=0.02911
(2283.4 *20*)	270.54	0.36 *3*	5.0 *5*	9.40^{1u} *4*	5.4 *5*	av Eβ=585.9 *9*; εK=0.7977; εL=0.1072; εM+=0.02801

† Absolute intensity per 100 decays.

γ(^{119}Sb)

Iγ normalization: from Σ Ti(to g.s.)=100.

E_γ ‡	I_γ ac	E_i(level)	J_i^π	E_f	J_f^π	Mult. b	δ	α †	Comments
116.62 *6*	0.68 *4*	1366.34	11/2$^-$	1249.74	9/2$^+$	E1		0.1223	α(K)exp=0.092 *+27−22* α(K)=0.1057 *15*; α(L)=0.01341 *19*; α(M)=0.00263 *4*; α(N+..)=0.000547 *8* α(N)=0.000500 *7*; α(O)=4.68×10^{-5} *7*
153.59 *3*	100 *4*	1366.34	11/2$^-$	1212.75	9/2$^+$	E1		0.0563	α(K)exp=0.052 *+5−4* α(K)=0.0487 *7*; α(L)=0.00610 *9*; α(M)=0.001197 *17*; α(N+..)=0.000250 *4* α(N)=0.000228 *4*; α(O)=2.16×10^{-5} *3* K:L1:L2:L3:M+=100 *4*:10.6 *4*:0.88 *14*:1.23 *16*:3.09 *19*.
164.34 *5*	1.96 *8*	1212.75	9/2$^+$	1048.42	7/2$^+$	M1+E2	+1.0 & *+11−7*	0.22 *6*	α(K)exp=0.144 *+20−18* α(K)=0.18 *4*; α(L)=0.032 *13*; α(M)=0.007 *3*; α(N+..)=0.0013 *6* α(N)=0.0012 *5*; α(O)=0.00011 *4* K:L:M=100 *8*:13 *3*:2.3 *4*.
x184.11 # *20*	0.04 *2*								
x190.54 # *20*	0.05 *2*								
x201.17 # *20*	0.02 *1*								
241.78 *8*	0.09 *2*	1212.75	9/2$^+$	970.90	9/2$^+$	M1(+E2)		0.065 *11*	α(K)exp=0.030 *+19−12* α(K)=0.055 *8*; α(L)=0.0083 *24*; α(M)=0.0017 *5*; α(N+..)=0.00034 *10* α(N)=0.00032 *9*; α(O)=2.9×10^{-5} *7*
270.53 *4*	42.3 *6*	270.54	7/2$^+$	0	5/2$^+$	M1+E2	−0.118 & *16*	0.0410	α(K)=0.0355 *5*; α(L)=0.00447 *7*; α(M)=0.000885 *13*; α(N+..)=0.000188 *3* α(N)=0.0001707 *25*; α(O)=1.687×10^{-5} *24* K:L1:L2:L3:M+=100.0 *17*:11.3 *3*:0.61 *10*:0.19 *3*:2.97 *15* (1977Ya03); K/L1=8.9 *+8−7*, L1/L2=12 *+5−3* (1982Sa22).
x369.7 # *3*	0.05 *2*								
395.42 *6*	0.50 *4*	1366.34	11/2$^-$	970.90	9/2$^+$	E1		0.00444 *7*	α(K)exp=0.0037 *+7−6* α=0.00444 *7*; α(K)=0.00386 *6*; α(L)=0.000469 *7*; α(M)=9.21×10^{-5} *13*; α(N+..)=1.94×10^{-5} *3* α(N)=1.770×10^{-5} *25*; α(O)=1.729×10^{-6} *25*
700.33 *8*	0.70 *8*	970.90	9/2$^+$	270.54	7/2$^+$	M1+E2		0.0035 *4*	α(K)exp=0.0029 *+9−7* α=0.0035 *4*; α(K)=0.0030 *4*; α(L)=0.00038 *3*; α(M)=7.5×10^{-5} *6*; α(N+..)=1.58×10^{-5} *12* α(N)=1.44×10^{-5} *11*; α(O)=1.42×10^{-6} *13*
x760.3 # *5*	0.07 *3*								
777.91 *19*	0.10 *6*	1048.42	7/2$^+$	270.54	7/2$^+$				α(K)exp=0.0014 *+28−7*

^{119}Te ε decay (4.70 d) 1977Ya03 (continued)

γ(^{119}Sb) (continued)

E_γ [‡]	I_γ [ac]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [b]	δ	α [†]	Comments
818.80 *17*	0.16 *4*	2226.06	11/2$^-$	1407.33	11/2$^+$				α(K)exp=0.0012 *+9−5*
859.68 *9*	0.24 *3*	2226.06	11/2$^-$	1366.34	11/2$^-$	M1(+E2)	≤0.89	0.00228 *11*	α(K)exp=0.0024 *+6−5* α=0.00228 *11*; α(K)=0.00198 *10*; α(L)=0.000242 *10*; α(M)=4.76×10^{-5} *19*; α(N+..)=1.01×10^{-5} *5* α(N)=9.2×10^{-6} *4*; α(O)=9.1×10^{-7} *5* δ: 0.89≤from α(K)exp (1977Ya03).
871.46 *13*	0.58 *5*	2278.92	13/2$^-$	1407.33	11/2$^+$	E1		0.000756 *11*	α(K)exp=0.00049 *+15−13* α=0.000756 *11*; α(K)=0.000659 *10*; α(L)=7.82×10^{-5} *11*; α(M)=1.535×10^{-5} *22*; α(N+..)=3.26×10^{-6} α(N)=2.96×10^{-6} *5*; α(O)=2.94×10^{-7} *5*
912.60 *5*	9.44 *12*	2278.92	13/2$^-$	1366.34	11/2$^-$	M1+E2	−0.41[&] *+6−5*	0.00202 *4*	α(K)exp=0.00181 *+14−13* α=0.00202 *4*; α(K)=0.00176 *3*; α(L)=0.000213 *4*; α(M)=4.20×10^{-5} *7*; α(N+..)=8.92×10^{-6} *14* α(N)=8.11×10^{-6} *13*; α(O)=8.08×10^{-7} *13* K/L=7.5 *+11−8*.
917.6 *3*	0.13 *6*	2129.82	9/2$^-$	1212.75	9/2$^+$				α(K)exp=0.0006 *+9−3*
942.21 *6*	7.69 *9*	1212.75	9/2$^+$	270.54	7/2$^+$	M1+E2	−0.72[&] *+14−10*	0.00181 *5*	α(K)exp=0.00157 *+12−11* α=0.00181 *5*; α(K)=0.00157 *4*; α(L)=0.000191 *4*; α(M)=3.77×10^{-5} *8*; α(N+..)=8.00×10^{-6} *18* α(N)=7.27×10^{-6} *16*; α(O)=7.22×10^{-7} *17* K:L:M=100 *3*:10.1 *14*:3.4 *4*.
952.82 *15*	0.13 *6*	2360.22	9/2$^-$	1407.33	11/2$^+$				α(K)exp=0.0007 *+8−4*
970.91 *15*	0.35 *5*	970.90	9/2$^+$	0	5/2$^+$	E2		0.001457 *21*	α(K)exp=0.0011 *+4−3* α=0.001457 *21*; α(K)=0.001263 *18*; α(L)=0.0001572 *22*; α(M)=3.10×10^{-5} *5*; α(N+..)=6.55×10^{-6} α(N)=5.97×10^{-6} *9*; α(O)=5.85×10^{-7} *9*
972.8	0.15 *10*	2379.55	(9/2,13/2)	1407.33	11/2$^+$				
976.37 *7*	4.10 *10*	2226.06	11/2$^-$	1249.74	9/2$^+$	E1		0.000606 *9*	α(K)exp=0.00059 *+7−6* α=0.000606 *9*; α(K)=0.000529 *8*; α(L)=6.25×10^{-5} *9*; α(M)=1.227×10^{-5} *18*; α(N+..)=2.60×10^{-6} *4* α(N)=2.37×10^{-6} *4*; α(O)=2.35×10^{-7} *4* K/L=9.5 *+89−33*.
979.29 *7*	4.55 *11*	1249.74	9/2$^+$	270.54	7/2$^+$	M1+E2	−0.38[&] *+11−8*	0.00173 *4*	α(K)exp=0.00164 *+14−13* α=0.00173 *4*; α(K)=0.00150 *3*; α(L)=0.000182 *4*; α(M)=3.58×10^{-5} *7*; α(N+..)=7.61×10^{-6} *14* α(N)=6.92×10^{-6} *12*; α(O)=6.90×10^{-7} *13* K:L:M=100 *3*:13.5 *18*:3.5 *13*.
1013.20[d] *8*	2.5[d] *5*	2226.06	11/2$^-$	1212.75	9/2$^+$				α(K)exp=0.00076 *7* K/L=17 *+9−5*.

$^{119}_{51}Sb_{68}$-3

^{119}Te ε decay (4.70 d) 1977Ya03 (continued)

γ(^{119}Sb) (continued)

E_γ ‡	I_γ ac	E_i(level)	J_i^π	E_f	J_f^π	Mult. b	δ	α †	Comments
									E_γ: doublet. The possibility of a single transition with mult=E1+M2 is excluded from inconsistency between the α(K)exp and γγ(θ) results. I_γ: divided from Iγ=3.78 *8* based on the α(K)exp and the assumed mult of E1.
1013.20 d *8*	1.3 d *9*	2379.55	(9/2,13/2)	1366.34	11/2⁻				I_γ: divided from Iγ=3.78 *8* based on the α(K)exp and the assumed mult of M1+E2.
1048.44 *6*	4.82 *7*	1048.42	7/2⁺	0	5/2⁺	M1(+E2)	≤0.97	0.00145 *8*	α(K)exp=0.00130 *+11−10* α=0.00145 *8*; α(K)=0.00126 *7*; α(L)=0.000152 *7*; α(M)=3.00×10^{-5} *14*; α(N+..)=6.4×10^{-6} *3* α(N)=5.8×10^{-6} *3*; α(O)=5.8×10^{-7} *3* K:L:M=100 *3*:8.9 *10*:2.6 *10*. δ: 0.97≤from α(K)exp (1977Ya03).
x1066.3 @ *3*	0.15 *5*								
1081.35 *10*	2.41 *5*	2129.82	9/2⁻	1048.42	7/2⁺	E1		0.000500 *7*	α(K)exp=0.00046 *+6−5* α=0.000500 *7*; α(K)=0.000436 *7*; α(L)=5.14×10^{-5} *8*; α(M)=1.009×10^{-5} *15*; α(N+..)=2.14×10^{-6} *3* α(N)=1.95×10^{-6} *3*; α(O)=1.94×10^{-7} *3* K/L=33 *+28−10*.
1095.75 *10*	3.38 *4*	1366.34	11/2⁻	270.54	7/2⁺	M2(+E3)	+0.12 *8*	0.00326 *6*	α(K)exp=0.00296 *+20−19* α=0.00326 *6*; α(K)=0.00282 *5*; α(L)=0.000353 *6*; α(M)=6.98×10^{-5} *11*; α(N+..)=1.483×10^{-5} *23* α(N)=1.349×10^{-5} *21*; α(O)=1.342×10^{-6} *21* K:L:M=100 *2*:14.6 *9*:3.0 *6*. δ: +0.12 *8* from weighted av of 0.13 *11* from γγ(θ) and 0.10 *+11−10* from α(K)exp (1977Ya03).
1111.2 *8*	0.017 *14*	2360.22	9/2⁻	1249.74	9/2⁺				α(K)exp=0.0005 *+24−8*
1136.75 *7*	11.57 *10*	1407.33	11/2⁺	270.54	7/2⁺	E2		0.001036 *15*	α(K)exp=0.00092 *6* α=0.001036 *15*; α(K)=0.000898 *13*; α(L)=0.0001101 *16*; α(M)=2.17×10^{-5} *3*; α(N+..)=6.15×10^{-6} α(N)=4.18×10^{-6} *6*; α(O)=4.12×10^{-7} *6*; α(IPF)=1.553×10^{-6} *22* K:L:M=100 *3*:11.0 *15*:2.4 *6*.
1212.73 *7*	100	1212.75	9/2⁺	0	5/2⁺	E2		0.000911 *13*	α(K)exp=0.00082 *4* α=0.000911 *13*; α(K)=0.000784 *11*; α(L)=9.57×10^{-5} *14*; α(M)=1.88×10^{-5} *3*; α(N+..)=1.244×10^{-5} *1* α(N)=3.63×10^{-6} *5*; α(O)=3.59×10^{-7} *5*; α(IPF)=8.44×10^{-6} *12* K:L:M=100.0 *17*:12.3 *5*:2.93 *11*.
1249.65 *17*	0.262 *19*	1249.74	9/2⁺	0	5/2⁺	(E2)		0.00095 *9*	α(K)exp=0.00089 *+18−15* α=0.00095 *9*; α(K)=0.00082 *8*; α(L)=9.9×10^{-5} *9*; α(M)=1.94×10^{-5} *18*; α(N+..)=1.73×10^{-5} *5*

$^{119}_{51}Sb_{68}$-4

^{119}Te ε decay (4.70 d) 1977Ya03 (continued)

γ(^{119}Sb) (continued)

E_γ ‡	I_γ ac	E_i(level)	J_i^π	E_f	J_f^π	Mult. b	δ	α †	Comments
									α(N)=3.7×10^{-6} *4*; α(O)=3.7×10^{-7} *4*; α(IPF)=1.32×10^{-5} *8*
1255.64 *24*	0.023 *12*	2226.06	11/2$^-$	970.90	9/2$^+$				α(K)exp=0.0006 *+13−3*
1312.01 *17*	0.185 *21*	2360.22	9/2$^-$	1048.42	7/2$^+$	E1		0.000447 *7*	α(K)exp=0.00021 *+11−9*
									α=0.000447 *7*; α(K)=0.000308 *5*; α(L)=3.62×10^{-5} *5*; α(M)=7.09×10^{-6} *10*; α(N+..)=9.59×10^{-5} *14*
									α(N)=1.370×10^{-6} *20*; α(O)=1.365×10^{-7} *20*; α(IPF)=9.44×10^{-5} *14*
1366.39 *14*	1.61 *3*	1366.34	11/2$^-$	0	5/2$^+$	E3		0.001360 *19*	α(K)exp=0.00111 *9*
									α=0.001360 *19*; α(K)=0.001163 *17*; α(L)=0.0001484 *21*; α(M)=2.94×10^{-5} *5*; α(N+..)=1.92×10^{-5}
									α(N)=5.65×10^{-6} *8*; α(O)=5.53×10^{-7} *8*; α(IPF)=1.296×10^{-5} *19*
									K/L=7.2 *+33−18*.
x1391.9	0.05 *1*								
x1407.43@ *15*	0.20 *10*								
x1700.8	0.03 *1*								
1859.0 *5*	0.21 *6*	2129.82	9/2$^-$	270.54	7/2$^+$				α(K)exp=0.00026 *+23−13*
1955.45# *20*	<0.04	2226.06	11/2$^-$	270.54	7/2$^+$				
2013.2 *4*	0.48 *3*	2283.8	9/2$^-$	270.54	7/2$^+$	E1		0.000786 *11*	α(K)exp=0.00014 *3*
									α=0.000786 *11*; α(K)=0.0001524 *22*; α(L)=1.773×10^{-5} *25*; α(M)=3.47×10^{-6} *5*; α(N+..)=0.000612
									α(N)=6.71×10^{-7} *10*; α(O)=6.71×10^{-8} *10*; α(IPF)=0.000612 *9*
2089.57 *12*	7.08 *8*	2360.22	9/2$^-$	270.54	7/2$^+$	E1(+M2)	+0.01 *6*	0.000830 *12*	α(K)exp=0.000139 *+16−15*
									α=0.000830 *12*; α(K)=0.000144 *3*; α(L)=1.67×10^{-5} *4*; α(M)=3.28×10^{-6} *7*; α(N+..)=0.000666 *10*
									α(N)=6.34×10^{-7} *14*; α(O)=6.34×10^{-8} *14*; α(IPF)=0.000665 *10*
									K/L=6.7 *+16−8*.
									δ: +0.01 *6* from γγ(θ) (1977Ya02).
x2126.3@ *4*	0.04 *2*								
x2225.6# *4*	<0.04								
x2242.0	0.01 *1*								
x2360.4@ *2*	<0.1								Eγ: assigned as 2089γ-270γ sum peak by 1977Ya03. However, no 2013γ-270γ sum peak is visible in the spectrum of 1977Ya03 which may indicate that part of the 2360 peak is due to a 2360γ.

† Additional information 2.

$^{119}_{51}Sb_{68}$-5

^{119}Te ε decay (4.70 d) 1977Ya03 (continued)

$\gamma(^{119}Sb)$ (continued)

‡ From ce data of 1977Ya03, except as noted.
# From 1975Du04.
@ From 1975Du04. Assigned as double-escape or sum peak in 1977Ya03.
& Value recommended in 1980Kr22.
[a] Relative to I(153.59γ)=100.
[b] From α(K)exp and ce ratios. The α(K)exp are based on relative Iγ and Ice(K) intensities normalized to α(K)(270.53γ)=0.0358, which is the theoretical value based on the multipolarity from the experimental L-subshell ratio.
[c] For absolute intensity per 100 decays, multiply by 0.661 *3*.
[d] Multiply placed with intensity suitably divided.
[x] γ ray not placed in level scheme.

$^{119}_{51}Sb_{68}$-6

^{119}Te ε decay (4.70 d) 1977Ya03

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence