^{128}Sb β^- decay (9.05 h) 1972Ke07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Zoltan Elekes and Janos Timar	NDS 129, 191 (2015)	28-Feb-2015

Parent: ^{128}Sb: E=0.0; J$^{\pi}$=8$^-$; T$_{1/2}$=9.05 h *4*; Q(β^-)=4363 *19*; %β^- decay=100.0

1972Ke07: ^{235}U(n,F) mass separation; Ge γ, $\gamma\gamma$; semi ce.

1975So09: ^{130}Te(d,α)^{128}Sb chemical separation; scintillator-scintillator $\gamma\gamma$(t), $\beta\gamma$(t).

^{128}Te Levels

E(level)	J$^{\pi}$	T$_{1/2}$	Comments
0.0	0$^+$	7.7×10^{24} y *4*	
743.30 *10*	2$^+$	3.30 ps *3*	
1497.30 *14*	4$^+$		
1811.38 *16*	6$^+$	0.48† ns *3*	
2133.55 *17*	5$^-$		
2337.85 *18*	(7)$^-$	2.404 ns *24*	T$_{1/2}$: from (814γ)(527γ)(t) (1975So09).
2405.67 *23*	(4$^+$,5,6$^+$)		
2588.0 *3*			
2655.4 *3*			
2689.4 *4*	(8$^+$)		
2736.6 *3*			
2762.26 *18*	3$^-$,4$^-$,5$^-$,6$^-$,7$^-$		
2817.4 *3*			
2858.9 *4*			
2924.1 *3*			
3030.7 *3*			
3140.5 *4*	2,3		
3151.44 *22*	(9$^-$)		
3183.5 *3*	(5)$^-$,(6)$^+$		
3416.53 *22*	$^-$		
3429.2 *3*			
3490.0 *3*			
3519.42 *25*			
3588.0 *3*			
3597.36 *25*			
3734.28 *23*			

† From (β)(754γ)(t) (1975So09). Energy range of Eβ is so chosen that β to 6$^+$ is most preferable. The choice of 754γ as γ gate is appropriate, since T$_{1/2}$ of 4$^+$ state is much shorter than that of 6$^+$.

β^- radiations

Iβ normalization: no β transition to g.s. was assumed.

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(629 *19*)	3734.28	6.1 *15*	6.50 *12*	av Eβ=200.5 *71*
(766 *19*)	3597.36	4.3 *15*	6.95 *16*	av Eβ=252.6 *74*
(775 *19*)	3588.0	2.0 *11*	7.30 *25*	av Eβ=256.3 *75*
(844 *19*)	3519.42	4.5 *7*	7.08 *8*	av Eβ=283.2 *76*
(873 *19*)	3490.0	5.5 *11*	7.05 *10*	av Eβ=294.9 *76*
(934 *19*)	3429.2	4.0 *5*	7.29 *7*	av Eβ=319.4 *77*
(946 *19*)	3416.53	15.3 *19*	6.73 *7*	av Eβ=324.5 *78*

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^{128}Sb β^- decay (9.05 h) 1972Ke07 (continued)

β^- radiations (continued)

E(decay)	E(level)	I$\beta^{-\dagger}$	Log *ft*	Comments
(1180 *19*)	3183.5	4.2 *6*	7.65 *7*	av Eβ=420.8 *81*
(1212 *19*)	3151.44	13.0 *24*	7.20 *9*	av Eβ=434.4 *81*
(1223 *19*)	3140.5	1.20 *21*	8.25 *8*	av Eβ=439.0 *81*
(1504 *19*)	2858.9	3.5 *4*	8.13 *6*	av Eβ=560.3 *84*
(1546 *19*)	2817.4	1.5 *11*	8.5 *4*	av Eβ=578.5 *84*
(1601 *19*)	2762.26	7 *3*	7.94 *19*	av Eβ=602.7 *84*
(1626 *19*)	2736.6	1.3 *4*	8.69 *14*	av Eβ=614.0 *84*
(1674 *19*)	2689.4	3.5 *5*	8.31 *7*	av Eβ=634.9 *85*
(1775 *19*)	2588.0	1.5 *3*	8.78 *9*	av Eβ=680.0 *85*
(2025 *19*)	2337.85	19 *4*	7.91 *10*	av Eβ=792.4 *86*

† Absolute intensity per 100 decays.

$\gamma(^{128}Te)$

Normalization: Σ I(γ+ce) to g.s.=100.

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[@]	Comments
102.8 *3*	0.4 *1*	3519.42		3416.53	$^-$				
^{x}118.4 *3*	0.6 *1*								
152.6 *3*	0.5 *1*	3183.5	$(5)^-,(6)^+$	3030.7					
204.4 *10*	1.0 *2*	2337.85	$(7)^-$	2133.55	5^-	E1+M2			
214.8 *2*	1.0 *2*	3734.28		3519.42					
227.3 *2*	1.5 *3*	3151.44	(9^-)	2924.1					
^{x}235.0 *1*	0.3 *1*								
249.7[&] *2*	0.6 *1*	2655.4		2405.67	$(4^+,5,6^+)$				
^{x}278.3 *3*	0.6 *1*								
314.1 *1*	61 *3*	1811.38	6^+	1497.30	4^+	E2		0.0333	α(K)exp=0.032 *5* α(K)=0.0278 *4*; α(L)=0.00442 *7*; α(M)=0.000895 *13*; α(N)=0.0001733 *25*; α(O)=1.721×10^{-5} *25* B(E2)(W.u.)=9.7 *6* Mult.: M1,E2 derived from α(K)exp in 1972Ke07. E2 from RUL.
317.7 *2*	3 *1*	3734.28		3416.53	$^-$				
322.3 *2*	3 *1*	2133.55	5^-	1811.38	6^+	E1+M2	+0.020 *6*		
357.0 *3*	1.5 *3*	2762.26	$3^-,4^-,5^-,6^-,7^-$	2405.67	$(4^+,5,6^+)$				
366.1 *3*	1.5 *3*	3183.5	$(5)^-,(6)^+$	2817.4					
404.3 *3*	1.0 *2*	3588.0		3183.5	$(5)^-,(6)^+$				
445.7 *3*	1.5 *3*	3597.36		3151.44	(9^-)				
454.5 *3*	1.5 *3*	2588.0		2133.55	5^-				
459.5 *3*	1.5 *3*	3490.0		3030.7					
526.5 *1*	45 *2*	2337.85	$(7)^-$	1811.38	6^+	E1+M2	+0.025 *28*	0.00235	α(K)exp=0.0019 *4* α(K)=0.00205 *3*; α(L)=0.000248 *4*; α(M)=4.92×10^{-5} *7*; α(N)=9.71×10^{-6} *14*; α(O)=1.049×10^{-6} *15* B(E1)(W.u.)=7.4×10^{-7} *5* Mult.: α(K)exp gives E1.
582.9 *3*	1.0 *2*	3734.28		3151.44	(9^-)				
594.3 *3*	1.0 *2*	2405.67	$(4^+,5,6^+)$	1811.38	6^+				
603.0 *3*	1.7 *3*	2736.6		2133.55	5^-				
628.7 *1*	31 *2*	2762.26	$3^-,4^-,5^-,6^-,7^-$	2133.55	5^-	M1,E2		0.0049 *5*	α(K)exp=0.0045 *1* α(K)=0.0042 *5*; α(L)=0.00054 *4*; α(M)=0.000108 *8*; α(N)=2.12×10^{-5} *15*; α(O)=2.28×10^{-6} *21* Mult.: α(K)exp gives M1,E2.
636.2 *1*	36 *2*	2133.55	5^-	1497.30	4^+	E1+M2	+0.020 *6*	1.54×10^{-3}	α(K)exp=0.0013 *3* α(K)=0.001339 *19*; α(L)=0.0001616 *23*;

γ(^{128}Te) (continued)

E_γ	I_γ[#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[@]	Comments
								α(M)=3.20×10^{-5} *5*; α(N)=6.32×10^{-6} *9*; α(O)=6.85×10^{-7} *10* Mult.: α(K)exp gives E1.
654.2 *2*	17 *1*	3416.53	$^-$	2762.26	$3^-,4^-,5^-,6^-,7^-$	M1,E2	0.0044 *5*	α(K)exp=0.0054 *15* α(K)=0.0038 *5*; α(L)=0.00049 *4*; α(M)=9.7×10^{-5} *7*; α(N)=1.92×10^{-5} *15*; α(O)=2.06×10^{-6} *20* Mult.: α(K)exp gives M1,E2.
667.1 *3*	2.5 *3*	3429.2		2762.26	$3^-,4^-,5^-,6^-,7^-$			
683.9 *3*	3 *1*	2817.4		2133.55	5^-			
692.9 *3*	2 *1*	3030.7		2337.85	$(7)^-$			
727.6 *3*	4 *1*	3490.0		2762.26	$3^-,4^-,5^-,6^-,7^-$			
743.3 *1*	100 *5*	743.30	2^+	0.0	0^+	E2	0.00288	α(K)exp=0.00245 α(K)=0.00248 *4*; α(L)=0.000322 *5*; α(M)=6.43×10^{-5} *9*; α(N)=1.266×10^{-5} *18*; α(O)=1.346×10^{-6} *19* Mult.: α(K)exp gives E2.
754.0 *1*	100 *5*	1497.30	4^+	743.30	2^+	E2	0.00278	α(K)exp=0.0025 *3* α(K)=0.00239 *4*; α(L)=0.000311 *5*; α(M)=6.20×10^{-5} *9*; α(N)=1.220×10^{-5} *17*; α(O)=1.299×10^{-6} *19* Mult.: α(K)exp gives E2.
773.7 *3*	1.5 *3*	3429.2		2655.4				
802.7 *3*	1.2 *2*	3140.5	2,3	2337.85	$(7)^-$			
813.6 *2*	13 *2*	3151.44	(9^-)	2337.85	$(7)^-$	E1	9.18×10^{-4}	α(K)exp=0.0009 *3* α(K)=0.000799 *12*; α(L)=9.57×10^{-5} *14*; α(M)=1.90×10^{-5} *3*; α(N)=3.75×10^{-6} *6*; α(O)=4.07×10^{-7} *6* Mult.: α(K)exp gives E1.
835.8 *4*	1 *1*	3597.36		2762.26	$3^-,4^-,5^-,6^-,7^-$			
845.8 *4*	2.5 *3*	3183.5	$(5)^-,(6)^+$	2337.85	$(7)^-$			
860.8 *4*	0.4 *1*	3597.36		2736.6				
878.0 *4*	3.5 *4*	2689.4	(8^+)	1811.38	6^+			
908.8 *4*	1 *1*	2405.67	$(4^+,5,6^+)$	1497.30	4^+			
972.3 *4*	1 *1*	3734.28		2762.26	$3^-,4^-,5^-,6^-,7^-$			
1047.5 *4*	3.5 *4*	2858.9		1811.38	6^+			
1078.6 *4*	2 *1*	3416.53	$^-$	2337.85	$(7)^-$			
1112.7 *4*	2 *1*	2924.1		1811.38	6^+			
^{x}1129.6 *4*	0.8 *2*							
1158.2 *4*	1.5 *3*	2655.4		1497.30	4^+			
1181.6 *4*	4.5 *5*	3519.42		2337.85	$(7)^-$			
1250.5 *4*	1 *1*	3588.0		2337.85	$(7)^-$			
1259.5 *4*	1 *1*	3597.36		2337.85	$(7)^-$			
1339.8 *4*	1 *1*	3151.44	(9^-)	1811.38	6^+			
^{x}1378.0 *4*	1.8 *4*							
^{x}1593.2 *5*	0.5 *1*							
1685.7 *5*	0.5 *1*	3183.5	$(5)^-,(6)^+$	1497.30	4^+			

γ(^{128}Te) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π
1707.9 *5*	0.3 *1*	3519.42		1811.38	6^+
1785.5 *5*	0.4 *1*	3597.36		1811.38	6^+

† From Adopted Levels. Those derived also from α(K)exp in ^{128}Sb β^- decay (9.05 h) are indicated in comments. α(K)exp were deduced by using I(γ)′s and I(ce)′s normalized so that α(K)(743.3γ)=0.00245 (E2).

‡ From Adopted Levels, Gammas.

[#] For absolute intensity per 100 decays, multiply by 1.00 *5*.

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

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

[x] γ ray not placed in level scheme.

$^{128}_{52}$Te$_{76}$-5

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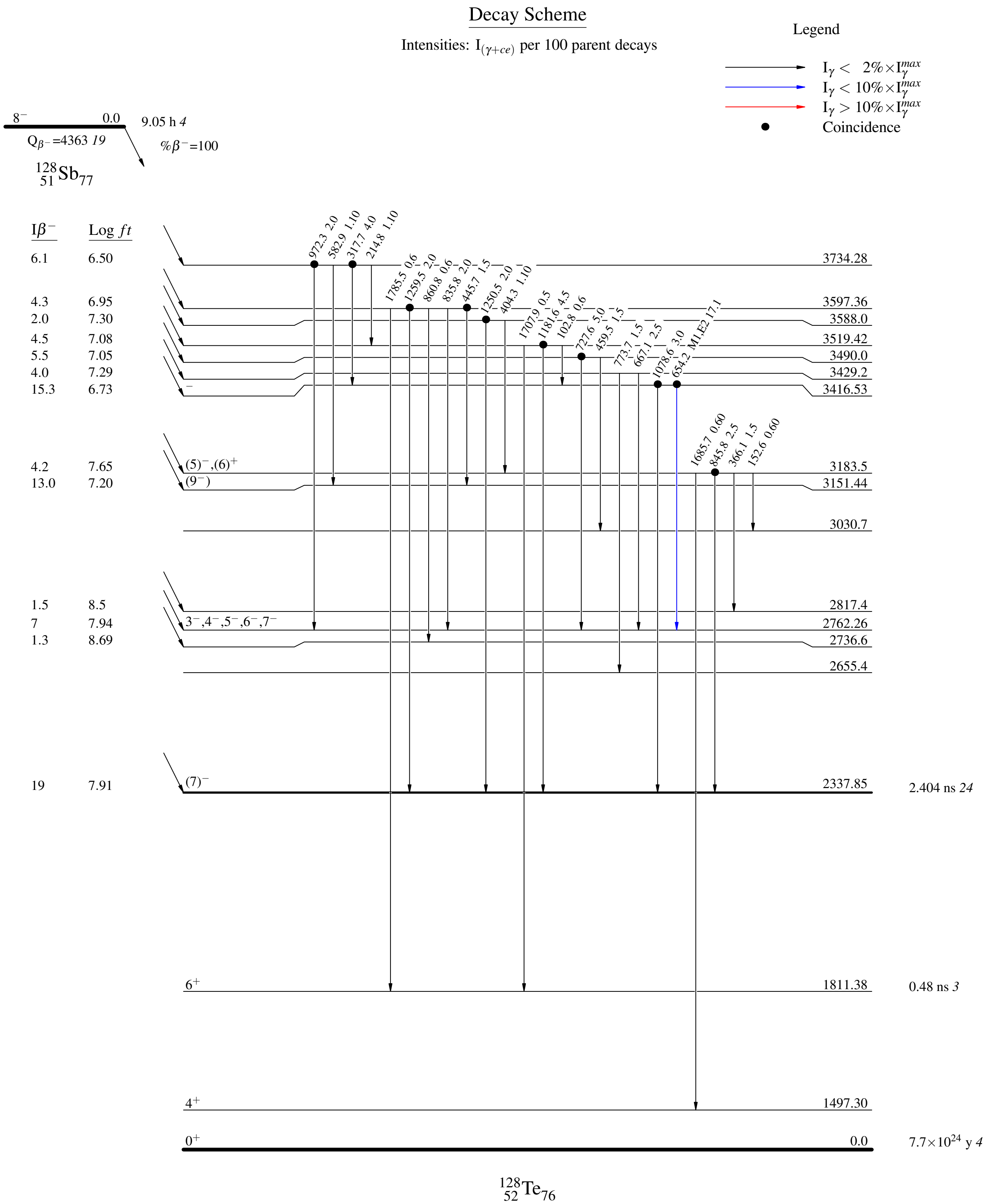

^{128}Sb β^- decay (9.05 h) 1972Ke07

Decay Scheme (continued)

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