



1 Decay Scheme

Sb-127 undergoes beta(minus) decay to excited levels in Te-127 (half-life of 9.35(10) h) with a beta branch of 83.2(6)%, and to Te-127m (half-life of 106.1(7) d) with a beta branch of 16.8(6)%.

L'antimoine 127 se désintègre par émissions bêta moins vers le niveau métastable du tellure 127 de 106 jours de période et des niveaux d'énergie supérieure.

2 Nuclear Data

$T_{1/2}(^{127}\text{Sb})$:	3,85	(7)	d
$T_{1/2}(^{127\text{m}}\text{Te})$:	106,1	(7)	d
$T_{1/2}(^{127}\text{Te})$:	9,35	(10)	h
$Q^-(^{127}\text{Sb})$:	1582	(5)	keV

2.1 β^- Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft
$\beta_{0,19}^-$	203 (5)	0,18 (4)	allowed	7,42
$\beta_{0,18}^-$	259 (5)	0,12 (2)	[allowed]	7,93
$\beta_{0,17}^-$	273 (5)	0,06 (2)	(allowed)	8,3
$\beta_{0,16}^-$	292 (5)	0,61 (4)	allowed	7,39
$\beta_{0,15}^-$	376 (5)	0,10 (4)	(allowed)	8,53
$\beta_{0,14}^-$	427 (5)	0,85 (25)	allowed	7,79
$\beta_{0,13}^-$	442 (5)	1,35 (21)	allowed	7,64
$\beta_{0,12}^-$	505 (5)	5,17 (14)	(allowed)	7,251
$\beta_{0,11}^-$	658 (5)	1,27 (25)	allowed	8,26
$\beta_{0,10}^-$	796 (5)	7,72 (21)	1st forbidden non-unique	7,766
$\beta_{0,9}^-$	799 (5)	17,2 (3)	allowed	7,425
$\beta_{0,7}^-$	897 (5)	34,4 (4)	allowed	7,304
$\beta_{0,6}^-$	951 (5)	4,00 (21)	1st forbidden non-unique	8,33
$\beta_{0,4}^-$	1109 (5)	22,6 (8)	allowed	7,826

	Energy keV	Probability × 100	Nature	lg <i>ft</i>
$\beta_{0,3}^-$	1241 (5)	2,4 (3)	(1st forbidden non-unique)	8,98
$\beta_{0,2}^-$	1494 (5)	2,0 (5)	1st forbidden unique	10,21

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	P _{$\gamma+ce$} × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}(\text{Te})$	61,16 (2)	5,93 (24)	M1+19,4%E2	2,93 (12)	0,99 (14)	0,21 (3)	4,2 (3)
$\gamma_{10,6}(\text{Te})$	154,7 (1)	0,15 (4)	M1+8%E2	0,182 (14)	0,026 (5)	0,0052 (11)	0,214 (20)
$\gamma_{3,2}(\text{Te})$	252,64 (9)	8,82 (15)	M1+82%E2	0,0541 (12)	0,0090 (4)	0,00182 (8)	0,0652 (17)
$\gamma_{9,5}(\text{Te})$	280,7 (1)	0,55 (4)	M1+0,8%E2	0,0351 (5)	0,00445 (7)	0,000888 (13)	0,0407 (6)
$\gamma_{6,3}(\text{Te})$	290,5 (1)	1,91 (7)	M1+14%E2	0,0326 (5)	0,00430 (7)	0,000859 (14)	0,0379 (6)
$\gamma_{11,6}(\text{Te})$	292,6 (2)	0,28 (14)	E1+1,5%M2	0,0103 (60)	0,00136 (16)	0,00027 (18)	0,012 (7)
$\gamma_{9,4}(\text{Te})$	309,4 (1)	0,078 (13)	M1+1%E2	0,0273 (4)	0,00345 (5)	0,000687 (10)	0,0316 (5)
$\gamma_{12,7}(\text{Te})$	392,0 (2)	0,94 (7)	M1+2,2%E2	0,01490 (21)	0,00187 (3)	0,000372 (6)	0,01722 (25)
$\gamma_{4,1}(\text{Te})$	412,10 (5)	3,48 (18)	E2	0,01210 (17)	0,001775 (25)	0,000357 (5)	0,01431 (20)
$\gamma_{15,9}(\text{Te})$	423,7 (7)	0,10 (4)	M1+50%E2	0,0117 (4)	0,00158 (4)	0,000316 (9)	0,0137 (4)
$\gamma_{5,1}(\text{Te})$	440,77 (2)	0,7 (3)	M1+20%E2	0,0109 (3)	0,001395 (22)	0,000278 (5)	0,0126 (3)
$\gamma_{10,3}(\text{Te})$	445,3 (1)	4,23 (11)	M1+50%E2	0,0102 (4)	0,001369 (23)	0,000274 (5)	0,0120 (4)
$\gamma_{11,4}(\text{Te})$	450,8 (2)	0,21 (7)	M1+33%E2	0,0101 (4)	0,001318 (20)	0,000263 (5)	0,0118 (4)
$\gamma_{13,7}(\text{Te})$	455,1 (1)	0,11 (7)	M1+50%E2	0,0097 (4)	0,001287 (19)	0,000258 (4)	0,0113 (4)
$\gamma_{4,0}(\text{Te})$	473,26 (4)	25,1 (7)	M1+4%E2	0,00928 (14)	0,001159 (17)	0,000231 (4)	0,01072 (16)
$\gamma_{5,0}(\text{Te})$	501,93 (1)	0,65 (11)	M1+10,4%E2	0,00795 (13)	0,000997 (14)	0,000199 (3)	0,00919 (14)
$\gamma_{6,2}(\text{Te})$	543,2 (1)	2,64 (11)	E2	0,00553 (8)	0,000761 (11)	0,0001525 (22)	0,00648 (9)
$\gamma_{11,3}(\text{Te})$	583,2 (2)	0,32 (18)	E1	0,001622 (23)	0,000196 (3)	0,0000389 (6)	0,00187 (3)
$\gamma_{12,4}(\text{Te})$	603,9 (2)	4,23 (11)	M1+2%E2	0,00513 (8)	0,000634 (10)	0,0001261 (18)	0,00592 (9)
$\gamma_{17,7}(\text{Te})$	624,2 (1)	0,064 (21)	M1+50%E2	0,0043 (3)	0,000550 (24)	0,000110 (5)	0,0050 (4)
$\gamma_{13,5}(\text{Te})$	638,3 (1)	0,35 (4)	M1+15%E2	0,00438 (7)	0,000544 (8)	0,0001083 (16)	0,00506 (8)
$\gamma_{14,5}(\text{Te})$	652,8 (1)	0,28 (4)	M1+5,4%E2	0,00423 (7)	0,000522 (8)	0,0001038 (16)	0,00488 (8)
$\gamma_{13,4}(\text{Te})$	666,9 (1)	0,53 (18)	M1+50%E2	0,0037 (3)	0,000464 (23)	0,000093 (5)	0,0042 (3)
$\gamma_{14,4}(\text{Te})$	681,4 (1)	0,53 (25)	M1+50%E2	0,00347 (25)	0,000440 (22)	0,000088 (5)	0,0040 (3)
$\gamma_{7,0}(\text{Te})$	685,09 (7)	35,5 (4)	E2	0,00303 (5)	0,000399 (6)	0,0000797 (12)	0,00352 (5)
$\gamma_{10,2}(\text{Te})$	697,9 (1)	3,37 (18)	E2	0,00289 (4)	0,000380 (6)	0,0000759 (11)	0,00336 (5)
$\gamma_{9,1}(\text{Te})$	721,5 (1)	1,78 (7)	E2	0,00266 (4)	0,000348 (5)	0,0000695 (10)	0,00309 (5)
$\gamma_{19,6}(\text{Te})$	747,2 (1)	0,11 (4)	E1	0,000951 (14)	0,0001142 (16)	0,0000226 (4)	0,001093 (16)
$\gamma_{8,0}(\text{Te})$	762,7 (1)	0,07 (4)	M1+50%E2	0,00265 (20)	0,000332 (19)	0,000066 (4)	0,00306 (22)
$\gamma_{9,0}(\text{Te})$	782,6 (1)	14,7 (3)	M1+4,2%E2	0,00277 (4)	0,000339 (5)	0,0000673 (10)	0,00319 (5)
$\gamma_{16,4}(\text{Te})$	816,5 (1)	0,27 (3)	M1+50%E2	0,00225 (17)	0,000282 (17)	0,000056 (4)	0,00260 (19)
$\gamma_{18,5}(\text{Te})$	821,5 (8)	0,117 (22)					
$\gamma_{11,0}(\text{Te})$	924,0 (2)	0,461 (25)	E2	0,001491 (21)	0,000189 (3)	0,0000376 (6)	0,001725 (25)
$\gamma_{13,0}(\text{Te})$	1140,2 (1)	0,35 (7)	M1+2%E2	0,001179 (20)	0,0001427 (23)	0,0000283 (5)	0,001358 (23)
$\gamma_{14,0}(\text{Te})$	1154,7 (1)	0,039 (21)	M1+E2				
$\gamma_{16,0}(\text{Te})$	1289,8 (1)	0,34 (3)	M1+0,04%E2	0,000901 (13)	0,0001087 (16)	0,0000216 (3)	0,001055 (15)
$\gamma_{19,0}(\text{Te})$	1378,6 (1)	0,07 (4)	M1+E2				

3 Atomic Data

3.1

ω_K : 0,875 (4)
 $\bar{\omega}_L$: 0,0862 (35)
 n_{KL} : 0,917 (4)

3.1.1 X Radiations

		Energy keV	Relative probability
X _K	Kα ₂	27,202	53,9
	Kα ₁	27,4726	100
	Kβ ₃	30,9446	}
	Kβ ₁	30,996	
	Kβ ₅ ^{''}	31,232	
	Kβ ₅ [']	31,242	}
	Kβ ₂	31,7008	
	Kβ ₄	31,774	
	KO _{2,3}	31,182	}
X _L	Lℓ	3,335	
	Lα	3,759 – 3,77	
	Lη	3,605	
	Lβ	4,03 – 4,302	
	Lγ	4,572 – 4,829	

3.1.2 Auger Electrons

		Energy keV	Relative probability
Auger K			
	KLL	21,804 – 22,989	100
	KLX	25,814 – 27,470	45,3
	KXY	29,80 – 31,81	5,15
Auger L			
		2,29 – 3,72	1330

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e _{AL}	(Te)	2,29 - 3,72	4,90 (14)
e _{AK}	(Te)		0,556 (26)
	KLL	21,804 - 22,989	}
	KLX	25,814 - 27,470	}
	KXY	29,80 - 31,81	}
ec _{1,0} T	(Te)	29,35 - 61,16	4,79 (24)
ec _{1,0} K	(Te)	29,35 (2)	3,36 (22)
ec _{1,0} L	(Te)	56,22 - 56,82	1,14 (9)
ec _{1,0} M	(Te)	60,15 - 60,59	0,24 (2)
ec _{1,0} N	(Te)	60,99 - 61,12	0,045 (4)
$\beta_{0,19}^-$	max:	203 (5)	0,18 (4)
$\beta_{0,19}^-$	avg:	55,9 (15)	
$\beta_{0,18}^-$	max:	259 (5)	0,12 (2)
$\beta_{0,18}^-$	avg:	72,8 (16)	
$\beta_{0,17}^-$	max:	273 (5)	0,06 (2)
$\beta_{0,17}^-$	avg:	77,2 (16)	
$\beta_{0,16}^-$	max:	292 (5)	0,61 (4)
$\beta_{0,16}^-$	avg:	83,4 (16)	
$\beta_{0,15}^-$	max:	376 (5)	0,10 (4)
$\beta_{0,15}^-$	avg:	110,7 (17)	
$\beta_{0,14}^-$	max:	427 (5)	0,85 (25)
$\beta_{0,14}^-$	avg:	128,2 (18)	
$\beta_{0,13}^-$	max:	442 (5)	1,35 (21)
$\beta_{0,13}^-$	avg:	133,2 (18)	
$\beta_{0,12}^-$	max:	505 (5)	5,17 (14)
$\beta_{0,12}^-$	avg:	155,3 (18)	
$\beta_{0,11}^-$	max:	658 (5)	1,27 (25)
$\beta_{0,11}^-$	avg:	211,5 (19)	
$\beta_{0,10}^-$	max:	796 (5)	7,72 (21)
$\beta_{0,10}^-$	avg:	264,4 (20)	
$\beta_{0,9}^-$	max:	799 (5)	17,2 (3)
$\beta_{0,9}^-$	avg:	265,8 (20)	
$\beta_{0,7}^-$	max:	897 (5)	34,4 (4)
$\beta_{0,7}^-$	avg:	304,5 (20)	
$\beta_{0,6}^-$	max:	951 (5)	4,00 (21)
$\beta_{0,6}^-$	avg:	326,2 (21)	
$\beta_{0,4}^-$	max:	1109 (5)	22,6 (8)
$\beta_{0,4}^-$	avg:	391,2 (21)	
$\beta_{0,3}^-$	max:	1241 (5)	2,4 (3)

		Energy keV	Electrons per 100 disint.
$\beta_{0,3}^-$	avg:	446,9 (22)	2,0 (5)
$\beta_{0,2}^-$	max:	1494 (5)	
$\beta_{0,2}^-$	avg:	562,4 (21)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Te)	3,335 — 4,829	0,462 (23)	
XK α_2	(Te)	27,202	1,11 (4)	} K α
XK α_1	(Te)	27,4726	2,06 (7)	
XK β_3	(Te)	30,9446	}	} K' β_1
XK β_1	(Te)	30,996	}	
XK β_5''	(Te)	31,232	}	
XK β_5'	(Te)	31,242	}	} K' β_2
XK β_2	(Te)	31,7008	}	
XK β_4	(Te)	31,774	}	
XKO _{2,3}	(Te)	31,182	}	

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}(\text{Te})$	61,16 (2)	1,140 (14)
$\gamma_{10,6}(\text{Te})$	154,7 (1)	0,12 (3)
$\gamma_{3,2}(\text{Te})$	252,64 (9)	8,28 (14)
$\gamma_{9,5}(\text{Te})$	280,7 (1)	0,53 (4)
$\gamma_{6,3}(\text{Te})$	290,5 (1)	1,84 (7)
$\gamma_{11,6}(\text{Te})$	292,6 (2)	0,28 (14)
$\gamma_{9,4}(\text{Te})$	309,4 (1)	0,076 (13)
$\gamma_{12,7}(\text{Te})$	392,0 (2)	0,92 (7)
$\gamma_{4,1}(\text{Te})$	412,10 (5)	3,43 (18)
$\gamma_{15,9}(\text{Te})$	423,7 (7)	0,10 (4)
$\gamma_{5,1}(\text{Te})$	440,77 (2)	0,7 (3)
$\gamma_{10,3}(\text{Te})$	445,3 (1)	4,18 (11)
$\gamma_{11,4}(\text{Te})$	450,8 (2)	0,21 (7)

	Energy keV	Photons per 100 disint.
$\gamma_{13,7}(\text{Te})$	455,1 (1)	0,11 (7)
$\gamma_{4,0}(\text{Te})$	473,26 (4)	24,8 (7)
$\gamma_{5,0}(\text{Te})$	501,93 (1)	0,64 (11)
$\gamma_{6,2}(\text{Te})$	543,2 (1)	2,62 (11)
$\gamma_{11,3}(\text{Te})$	583,2 (2)	0,32 (18)
$\gamma_{12,4}(\text{Te})$	603,9 (2)	4,21 (11)
$\gamma_{17,7}(\text{Te})$	624,2 (1)	0,064 (21)
$\gamma_{13,5}(\text{Te})$	638,3 (1)	0,35 (4)
$\gamma_{14,5}(\text{Te})$	652,8 (1)	0,28 (4)
$\gamma_{13,4}(\text{Te})$	666,9 (1)	0,53 (18)
$\gamma_{14,4}(\text{Te})$	681,4 (1)	0,53 (25)
$\gamma_{7,0}(\text{Te})$	685,09 (7)	35,4 (4)
$\gamma_{10,2}(\text{Te})$	697,9 (1)	3,36 (18)
$\gamma_{9,1}(\text{Te})$	721,5 (1)	1,77 (7)
$\gamma_{19,6}(\text{Te})$	747,2 (1)	0,11 (4)
$\gamma_{8,0}(\text{Te})$	762,7 (1)	0,07 (4)
$\gamma_{9,0}(\text{Te})$	782,6 (1)	14,7 (3)
$\gamma_{16,4}(\text{Te})$	816,5 (1)	0,27 (3)
$\gamma_{18,5}(\text{Te})$	821,5 (8)	0,117 (22)
$\gamma_{11,0}(\text{Te})$	924,0 (2)	0,460 (25)
$\gamma_{13,0}(\text{Te})$	1140,2 (1)	0,35 (7)
$\gamma_{14,0}(\text{Te})$	1153,99 (9)	0,039 (21)
$\gamma_{16,0}(\text{Te})$	1288,90 (8)	0,34 (3)
$\gamma_{19,0}(\text{Te})$	1378,6 (1)	0,07 (4)

6 Main Production Modes

Te – 128(γ ,p)Sb – 127

Te – 130(d, α n)Sb – 127

U – 235(n,f)Sb – 127

U – 235(d,f)Sb – 127

U – 235(α ,f)Sb – 127

U – 238(n,f)Sb – 127

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