$^{127m}_{52}$Te$_{75}$

1 Decay Scheme

Te-127m decays predominantly by isomeric transition with a total IT branch of 97.27(7)% directly to the ground state, and by a β^- branch of 2.73(7)% to nuclear levels of I-127 (primarily the first excited state of I-127).
Le tellure 127 metastable se déexcite vers le niveau fondamental du tellure 127 principalement et, pour une faible part, se désintègre par émissions β^- vers des niveaux excités de l'iode 127.

2 Nuclear Data

$T_{1/2}$(^{127m}Te)	:	106,1	(7)	d
$T_{1/2}$(^{127}Te)	:	9,35	(10)	h
Q^{IT}(^{127m}Te)	:	88,23	(7)	keV
Q^-(^{127m}Te)	:	790	(4)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,8}$	74 (4)	0,0141 (6)	1st Forbidden	8,61
$\beta^-_{0,7}$	139 (4)	0,0027 (2)	1st Forbidden	10,18
$\beta^-_{0,6}$	161 (4)	0,00009 (2)	Unique 1st Forbidden	11,3
$\beta^-_{0,1}$	732 (4)	2,71 (7)	Unique 1st Forbidden	9,873

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}$(I)	57,608 (11)	2,73 (5)	M1+0,7%E2	3,16 (5)	0,449 (8)	0,0910 (16)	3,72 (6)
$\gamma_{2,0}$(Te)	88,23 (7)	97,3 (18)	M4	486 (7)	506 (8)	120,4 (18)	1138 (17)
$\gamma_{7,1}$(I)	593,31 (8)	0,0024 (2)	M1+5%E2	0,00578 (9)	0,000722 (11)	0,0001448 (21)	0,00668 (10)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{6,0}$(I)	628,69 (16)	0,00009 (2)	M1+50%E2	0,0045 (4)	0,00058 (3)	0,000117 (6)	0,0052 (4)
$\gamma_{7,0}$(I)	650,92 (8)	0,0003 (2)	E2	0,00362 (5)	0,000488 (7)	0,0000985 (14)	0,00423 (6)
$\gamma_{8,1}$(I)	658,89 (6)	0,0141 (6)	E2	0,00351 (5)	0,000472 (7)	0,0000953 (14)	0,00410 (6)

3 Atomic Data

3.1 I

ω_K : 0,882 (4)
$\bar{\omega}_L$: 0,092 (4)
n_{KL} : 0,909 (4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	28,3175		53,9
	$K\alpha_1$	28,6123		100
	$K\beta_3$	32,2397	}	
	$K\beta_1$	32,2951	}	
	$K\beta_5''$	32,539	}	28,8
	$K\beta_5'$	32,55	}	
	$K\beta_2$	33,042	}	
	$K\beta_4$	33,12	}	6,51
	$KO_{2,3}$	33,166	}	
X_L				
	$L\ell$	3,485		
	$L\alpha$	3,927 – 3,938		
	$L\eta$	3,779		
	$L\beta$	4,221 – 4,508		
	$L\gamma$	4,801 – 5,060		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	22,659 – 23,909	100
KLX	26,853 – 28,609	45,7
KXY	31,02 – 33,16	5,24
Auger L	2,37 – 3,88	1220

3.2 Te

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

3.2.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	27,202		53,4
	$K\alpha_1$	27,4726		100
	$K\beta_3$	30,9446	}	
	$K\beta_1$	30,996	}	
	$K\beta_5''$	31,232	}	28,5
	$K\beta_5'$	31,242	}	
	$K\beta_2$	31,7008	}	
	$K\beta_4$	31,774	}	6,22
	$KO_{2,3}$	31,182	}	
X_L				
	$L\ell$	3,335		
	$L\alpha$	3,759 – 3,77		
	$L\eta$	3,605		
	$L\beta$	4,03 – 4,302		
	$L\gamma$	4,572 – 4,829		

3.2.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	21,804 – 22,989	100
KLX	25,814 – 27,470	45,2
KXY	29,80 – 31,81	5,13
Auger L	2,29 – 3,72	2154

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e_{AL}	(I)	2,37 - 3,88		1,74 (3)
e_{AK}	(I)			0,216 (9)
	KLL	22,659 - 23,909	}	
	KLX	26,853 - 28,609	}	
	KXY	31,02 - 33,16	}	
e_{AL}	(Te)	2,29 - 3,72		74,3 (10)
e_{AK}	(Te)			5,19 (21)
	KLL	21,804 - 22,989	}	
	KLX	25,814 - 27,470	}	
	KXY	29,80 - 31,81	}	
$ec_{1,0\ T}$	(I)	24,44 - 57,61		2,15 (5)
$ec_{1,0\ K}$	(I)	24,44	(1)	1,83 (3)
$ec_{1,0\ L}$	(I)	52,42 - 53,05		0,26 (1)
$ec_{1,0\ M}$	(I)	56,54 - 56,99		0,0526 (13)
$ec_{2,0\ T}$	(Te)	56,42 - 88,23		97,2 (23)
$ec_{2,0\ K}$	(Te)	56,42	(7)	41,5 (10)
$ec_{2,0\ L}$	(Te)	83,29 - 83,89		43,2 (11)
$ec_{2,0\ M}$	(Te)	87,22 - 87,66		10,28 (25)
$ec_{2,0\ N}$	(Te)	88,06 - 88,19		1,98 (5)
$\beta^-_{0,8}$	max:	74	(4)	0,0141 (6)
$\beta^-_{0,8}$	avg:	19,1	(11)	
$\beta^-_{0,7}$	max:	139	(4)	0,0027 (2)
$\beta^-_{0,7}$	avg:	37,2	(12)	

		Energy keV		Electrons per 100 disint.
$\beta^-_{0,6}$	max:	161	(4)	0,00009 (2)
$\beta^-_{0,6}$	avg:	52,9	(14)	
$\beta^-_{0,1}$	max:	732	(4)	2,71 (7)
$\beta^-_{0,1}$	avg:	255,9	(15)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(I)	3,485 — 5,060		0,177 (9)	
XKα_2	(I)	28,3175		0,459 (12)	} Kα
XKα_1	(I)	28,6123		0,852 (21)	}
XKβ_3	(I)	32,2397	}		
XKβ_1	(I)	32,2951	}	0,245 (7)	K$'\beta_1$
XKβ_5''	(I)	32,539	}		
XKβ_5'	(I)	32,55	}		
XKβ_2	(I)	33,042	}		
XKβ_4	(I)	33,12	}	0,0555 (19)	K$'\beta_2$
XKO$_{2,3}$	(I)	33,166	}		
XL	(Te)	3,335 — 4,829		7,0 (3)	
XKα_2	(Te)	27,202		10,3 (3)	} Kα
XKα_1	(Te)	27,4726		19,3 (5)	}
XKβ_3	(Te)	30,9446	}		
XKβ_1	(Te)	30,996	}	5,51 (15)	K$'\beta_1$
XKβ_5''	(Te)	31,232	}		
XKβ_5'	(Te)	31,242	}		
XKβ_2	(Te)	31,7008	}		
XKβ_4	(Te)	31,774	}	1,20 (5)	K$'\beta_2$
XKO$_{2,3}$	(Te)	31,182	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}$(I)	57,608 (11)	0,578 (10)
$\gamma_{2,0}$(Te)	88,23 (7)	0,0854 (16)
$\gamma_{7,1}$(I)	593,31 (8)	0,0024 (2)
$\gamma_{6,0}$(I)	628,69 (16)	0,00009 (2)
$\gamma_{7,0}$(I)	650,92 (8)	0,0003 (2)
$\gamma_{8,1}$(I)	658,89 (6)	0,0140 (6)

6 Main Production Modes

Te – 126(n,γ)Te – 127m

Te – 128(n,2n)Te – 127m

U – 235(n,f)Sb – 127

Sb – 127(β^-)Te – 127m

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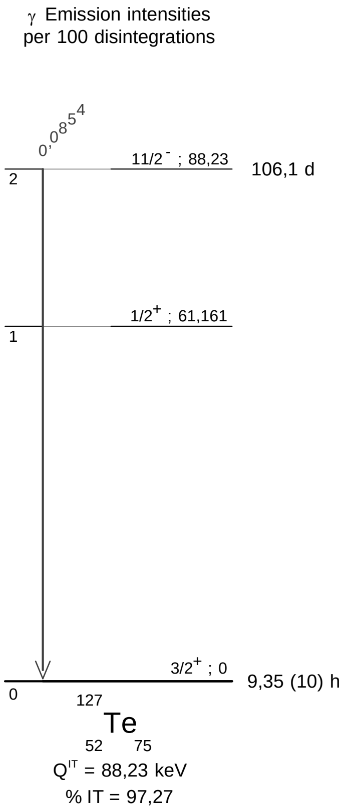
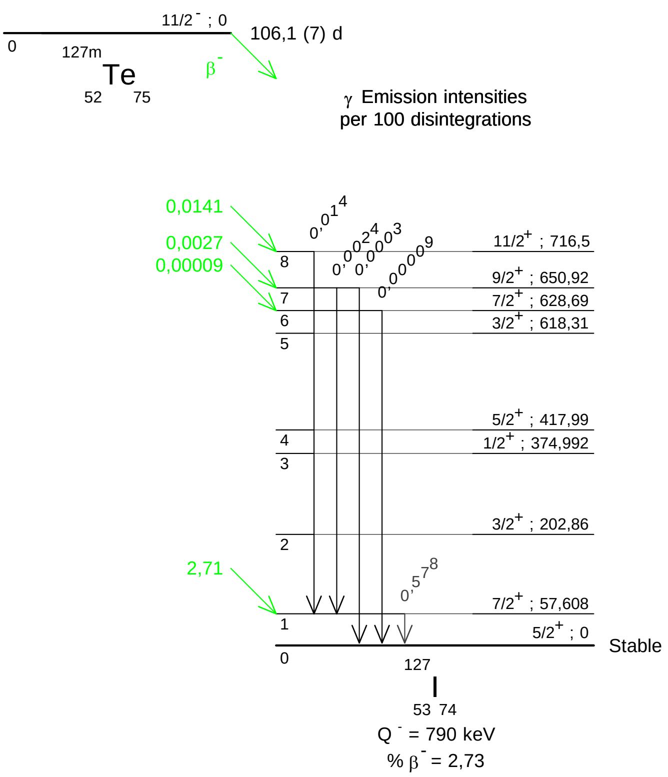

γ Emission intensities
per 100 disintegrations
0,0854
11/2⁻ ; 88,23
106,1 d
2
1/2+ ; 61,161
1
3/2+ ; 0
9,35 (10) h
0
127
Te
52
75
Q^IT = 88,23 keV
% IT = 97,27


11/2⁻ ; 0
106,1 (7) d
0
127m
Te
52 75
β⁻
γ Emission intensities
per 100 disintegrations
0,0141
0,0027
0,00009
2,71
8
7
6
5
4
3
2
1
0
11/2⁺ ; 716,5
9/2⁺ ; 650,92
7/2⁺ ; 628,69
3/2⁺ ; 618,31
5/2⁺ ; 417,99
1/2⁺ ; 374,992
3/2⁺ ; 202,86
7/2⁺ ; 57,608
5/2⁺ ; 0
Stable
127
I
53 74
Q⁻ = 790 keV
% β⁻ = 2,73