

¹¹¹Te ε decay:26.2 s 2005Sh24

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 110, 1239 (2009)	1-Feb-2008

Parent: ¹¹¹Te: E=0.0; J^π=5/2⁺; T_{1/2}=26.2 s 6; Q(ε)=7400 80; %ε+%β⁺ decay=100.0

¹¹¹Te-Q(ε): from 2003Au03.

¹¹¹Te-T_{1/2}: from least-squares fit of time dependence of combined decay rates for 851 and 881 γ rays.

¹¹¹Te-β-decay of ¹¹¹Te proposed to occur by “even-jumping” (from literature) via a GT transition to form a three quasiparticle state in ¹¹¹Sb (refer to 2005Sh24 for detailed configurations).

¹¹¹Te isotope produced in ⁵⁸Ni(⁵⁶Fe,2pn) reaction at E=225 MeV. Reaction products separated in fragment mass analyzer (FMA).

Measured E_γ, I_γ, γγ, γ(t), γγ(t) with two large HPGe detectors (45% and 65%) and two small Ge detectors (≈25%). Two plastic scintillators were used to veto 0° γγ events in same detector and to obtain 180° γγ coin data.

¹¹¹Sb Levels

E(level) [†]	J ^π	Comments
0.0	5/2 ⁺	Configuration=πd _{5/2} .
487.5 8	(1/2 ⁺)	J ^π : level not observed in high-spin studies implying spin of <7/2. Assignment of 1/2 ⁺ from systematics of neighboring isotope ¹¹³ Sb and intensity balance arguments involving the 1392γ. J ^π =3/2 ⁺ or 5/2 ⁺ cannot be ruled out.
850.6 5	7/2 ⁺	J ^π : level not observed in high-spin studies implying spin of <7/2. Assignment of 3/2 ⁺ from systematics of neighboring isotope ¹¹³ Sb. J ^π =1/2 ⁺ or 5/2 ⁺ cannot be ruled out.
880.7 6	(3/2 ⁺)	
1146.8 8	9/2 ⁺	E(level): existence of level based on assumption of smoothly varying systematics for second 7/2 ⁺ level in neighboring odd-A Sb isotopes.
1268.0? 10	(7/2 ⁺)	
1397.8 8	9/2 ⁺	level interpreted as (π ⁻¹)(π ²) prolate intruder state.
1576.8 8		
1711.9 8		
1879.9 6		
2026.8 8		
2119.8 8		
2160.8 8		
2357.1 7		
2612.8 8		

[†] From least-squares fit to E_γ's ; ΔE_γ=1 keV assumed for each transition unless stated otherwise.

γ(¹¹¹Sb)

E _γ	I _γ	E _i (level)	J _i ^π	E _f	J _f ^π	Comments
296 [‡]	2 1	1146.8	9/2 ⁺	850.6	7/2 ⁺	I _γ : uncertainty seems too small to be realistic, probably should be 1.0 (compilers' note).
487	45 7	487.5	(1/2 ⁺)	0.0	5/2 ⁺	
547	7.4 1	1397.8	9/2 ⁺	850.6	7/2 ⁺	
727	14 2	1576.8		850.6	7/2 ⁺	
831	6 2	1711.9		880.7	(3/2 ⁺)	
851	100 2	850.6	7/2 ⁺	0.0	5/2 ⁺	
881	92 3	880.7	(3/2 ⁺)	0.0	5/2 ⁺	
999 [†] 1	22 5	1879.9		880.7	(3/2 ⁺)	
1031 [†] 1	22 3	1879.9		850.6	7/2 ⁺	
1147	30 2	1146.8	9/2 ⁺	0.0	5/2 ⁺	
1176	19 4	2026.8		850.6	7/2 ⁺	

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^{111}Te ε decay: 26.2 s [2005Sh24](#) (continued) $\gamma(^{111}\text{Sb})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
1268 [‡]	25 15	1268.0?	(7/2 ⁺)	0.0	5/2 ⁺	I _{γ} : 1268 γ peak present in 851 γ -gated spectra at only about half the expected intensity, based on intensities of 1176 and 1506 transitions.
1269	30 15	2119.8		850.6	7/2 ⁺	
1310	4 1	2160.8		850.6	7/2 ⁺	
1392	25 5	1879.9		487.5	(1/2 ⁺)	
1398	16 5	1397.8	9/2 ⁺	0.0	5/2 ⁺	
1477	10 1	2357.1		880.7	(3/2 ⁺)	
1506	18.1 5	2357.1		850.6	7/2 ⁺	
1576	21 3	1576.8		0.0	5/2 ⁺	
1712	13 3	1711.9		0.0	5/2 ⁺	
1762	19 3	2612.8		850.6	7/2 ⁺	
1879	6.9 4	1879.9		0.0	5/2 ⁺	
2027	8.5 9	2026.8		0.0	5/2 ⁺	
2120	17 3	2119.8		0.0	5/2 ⁺	
2161	15 2	2160.8		0.0	5/2 ⁺	
2357	18 2	2357.1		0.0	5/2 ⁺	
2613	6 1	2612.8		0.0	5/2 ⁺	

[†] Energy of transition ambiguous in time-subtracted spectrum for decay of ^{111}Te . $\Delta E_\gamma=1$ keV assigned by [2005Sh24](#) because of strong overlap of the 997 and 1032 transitions from β^+ decay of ^{111}Sb .

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

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Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - γ Decay (Uncertain)

Decay Scheme

Intensities: Relative I_γ 