

$^{126}\text{I}$   $\varepsilon$  decay [1977Ja04](#),[1998Fo05](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	H. Iimura, J. Katakura, S. Ohya		NDS 180, 1 (2022)	1-Oct-2021

Parent:  $^{126}\text{I}$ :  $E=0.0$ ;  $J^\pi=2^-$ ;  $T_{1/2}=12.93$  d 5;  $Q(\varepsilon)=2154$  4;  $\% \varepsilon + \% \beta^+$  decay=52.7 5

$^{126}\text{I}$ - $\% \varepsilon + \% \beta^+$  decay: from X $\gamma$  coin and  $4\pi\beta\gamma$  ([1998Fo05](#)). Other:  $I(\beta^+)/I(\beta^-)=0.028$  1;  $I(406\beta^+)/I(1110\beta^+)=0.21$  ([1955Ko14](#)).

[1977Ja04](#):  $^{127}\text{I}(n,2n)$ , Compton suppression spectrometer, semi  $\gamma$ .

[1998Fo05](#):  $^{127}\text{I}(n,2n)$ ; HPGe, scin, gas counter  $\gamma$ ,  $\beta$ , K x ray;  $4\pi\beta\gamma$ , X $\gamma$  coin.

Others: semi  $\gamma$ : [1970Ga32](#), [1970Si05](#), [1971Mi20](#), [1971Zh01](#), [1972Ka20](#), [1975Ok04](#), [1976Gr04](#); magnetic spectrometer: [1970Ga32](#), [1971Zh01](#);  $\gamma\gamma(\theta)$ : [1959Sa05](#), [1971Gr14](#), [1971Ta04](#).

The decay scheme is that proposed by [1977Ja04](#). Evaluators note that the 1396(0<sup>+</sup>), 1685(0<sup>+</sup>), 2601(0<sup>+</sup>) and 2051 states in  $^{126}\text{Te}$  in the decay proposed by [1971Zh01](#) have not been confirmed by [1975Ok04](#), [1976Gr04](#) or [1977Ja04](#).

See also  $^{126}\text{I}$   $\beta^-$  decay.

 $^{126}\text{Te}$  Levels

E(level)	$J^\pi^\dagger$
0.0	0 <sup>+</sup>
666.338 12	2 <sup>+</sup>
1361.3 3	4 <sup>+</sup>
1420.166 16	2 <sup>+</sup>
1873.1 3	0 <sup>+</sup>
2045.11 5	2 <sup>+</sup>

<sup>†</sup> Spin and parity values are those given under Adopted Levels.

 $\varepsilon, \beta^+$  radiations

E(decay)	E(level)	$I\beta^+$ <sup>†#</sup>	$I\varepsilon$ <sup>†#</sup>	Log $ft$	$I(\varepsilon + \beta^+)$ <sup>†#</sup>	Comments
(109 4)	2045.11		0.0070 4	8.55 5	0.0070 4	$\varepsilon K=0.768$ 6; $\varepsilon L=0.180$ 4; $\varepsilon M+=0.0511$ 13
(281 4)	1873.1		0.00046 14	10.13 <sup>1u</sup> 14	0.00046 14	$\varepsilon K=0.7679$ 22; $\varepsilon L=0.1806$ 16; $\varepsilon M+=0.0515$ 6
(734 4)	1420.166		4.46 10	7.625 13	4.46 10	$\varepsilon K=0.8503$ ; $\varepsilon L=0.11828$ 5; $\varepsilon M+=0.03145$ 2
(793 4)	1361.3		$\leq 0.0002$	$\geq 12.4$ <sup>1u</sup>	$\leq 0.0002$	$\varepsilon K=0.8382$ 2; $\varepsilon L=0.1275$ 1; $\varepsilon M+=0.03434$ 4
(1488 4)	666.338	0.196 8	28.7 7	7.448 13	28.9 7	av $E\beta=216.0$ 18; $\varepsilon K=0.8494$ 2; $\varepsilon L=0.11370$ 4; $\varepsilon M+=0.03007$ 1 $I\beta^+$ : from $\beta^+$ (666 level)/ $\beta^+$ (g.s.)=0.29 1 ( <a href="#">1955Ko14</a> ).
(2154 4)	0.0	0.80 3	18.6 7	9.201 <sup>1u</sup> 18	19.4 <sup>‡</sup> 7	av $E\beta=529.3$ 18; $\varepsilon K=0.8179$ 5; $\varepsilon L=0.11137$ 8; $\varepsilon M+=0.02953$ 2

<sup>†</sup> From intensity balance at each level except where noted otherwise.

<sup>‡</sup> From  $\Sigma I(\gamma+ce)(to\ gs)=33.3\%$  4 and  $\%(\varepsilon+\beta^+)=52.7\%$  5.

# Absolute intensity per 100 decays.

γ(<sup>126</sup>Te)

I(γ<sup>±</sup>)/I(666γ)=0.0587 7 ([1977Ja04](#)).

γγ(θ) data

1971Ta04		
cascade	A <sub>2</sub>	A <sub>4</sub>
754-666	+0.102 10	+0.34 3

E <sub>γ</sub> <sup>†</sup>	I <sub>γ</sub> <sup>‡&amp;</sup>	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult. <sup>@</sup>	δ <sup>@</sup>	α <sup>a</sup>	Comments
666.331 12	0.329 4	666.338	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2		0.00378 5	α(K)=0.00324 5; α(L)=0.000430 6; α(M)=8.59×10 <sup>-5</sup> 12
695.0 <sup>b</sup>	≈2.3×10 <sup>-6</sup> <sup>#</sup>	1361.3	4 <sup>+</sup>	666.338	2 <sup>+</sup>	E2		0.00340 5	α(K)=0.00292 4; α(L)=0.000384 6; α(M)=7.67×10 <sup>-5</sup> 11
753.819 13	0.0415 5	1420.166	2 <sup>+</sup>	666.338	2 <sup>+</sup>	M1+E2	-4.25 +15-10	0.00282 4	α(K)=0.00243 4; α(L)=0.000314 5; α(M)=6.27×10 <sup>-5</sup> 9
1206.8 3	4.6×10 <sup>-6</sup> <sup>#</sup> 13	1873.1	0 <sup>+</sup>	666.338	2 <sup>+</sup>	E2			
1378.76	2.37×10 <sup>-6</sup> <sup>#</sup> 18	2045.11	2 <sup>+</sup>	666.338	2 <sup>+</sup>	M1+(E2)			
1420.19 3	0.00304 8	1420.166	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2			
2045.09 5	4.6×10 <sup>-5</sup> <sup>#</sup> 4	2045.11	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2			I <sub>γ</sub> : other: 0.891 19 ( <a href="#">1977Ja04</a> ).

<sup>†</sup> From [1977Ja04](#). The evaluators have added 10 eV in quadrature to the uncertainties of [1977Ja04](#) to account for the uncertainty in calibration.

<sup>‡</sup> The absolute values from [1998Fo05](#), unless otherwise noted.

<sup>#</sup> I<sub>γ</sub> from [1977Ja04](#) is normalized to the value of [1998Fo05](#) at the strong 666γ.

<sup>@</sup> From Adopted Levels, gammas.

<sup>&</sup> For absolute intensity per 100 decays, multiply by 0.527 5.

<sup>a</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ-ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

<sup>b</sup> Placement of transition in the level scheme is uncertain.

$^{126}\text{I}$   $\epsilon$  decay 1977Ja04,1998Fo05

## Decay Scheme

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

## Legend

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

