

<sup>116</sup>Te ε decay 1981Mo10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

Parent: <sup>116</sup>Te: E=0.0; J<sup>π</sup>=0<sup>+</sup>; T<sub>1/2</sub>=2.49 h 4; Q(ε)=1.55×10<sup>3</sup> 3; %ε+%β<sup>+</sup> decay=100.0

Activity produced from <sup>116</sup>Sn(<sup>3</sup>He,3n), E=32 MeV, enriched target.

Measured: γ(1968Ki07,1968Ra14,1972MoYL,1981Mo10) semi; α (1961Fi05,1968Ra23,1968Ki07) mag spect; γγ-coin (1968Ki07) mag spect.

<sup>116</sup>Sb Levels

E(level)	J <sup>π</sup>	T <sub>1/2</sub>
0.0	3 <sup>+</sup>	15.8 min 8
93.75 6	1 <sup>+</sup>	
103.02 6	2 <sup>+</sup>	
466.00 7	(3,4)	
550.87 6	2 <sup>+</sup>	
574.46 6	(2,3,4)	
731.70 7	1 <sup>+</sup>	
917.69 10	1 <sup>+</sup>	
1158.29 10	1 <sup>+</sup>	

ε,β<sup>+</sup> radiations

E(decay)	E(level)	Iβ <sup>+</sup> †	Iε †	Log ft	I(ε+β <sup>+</sup> ) †	Comments
(3.9×10 <sup>2</sup> 3)	1158.29		0.96 9	5.6 3	0.96 9	εK= 0.844 7; εL= 0.124 5; εM+= 0.0327 16
(6.3×10 <sup>2</sup> 3)	917.69		0.38 8	6.44 18	0.38 8	εK= 0.8506 21; εL= 0.1183 16; εM+= 0.0311 5
(8.2×10 <sup>2</sup> 3)	731.70		4.36 10	5.61 12	4.36 10	εK= 0.8531 12; εL= 0.1164 9; εM+= 0.0305 3
(1.46×10 <sup>3</sup> 3)	93.75	0.6 11	93.7 15	4.79 7	94.3 10	av Eβ= 206 44; εK= 0.851 6; εL= 0.1130 11; εM+= 0.0295 3 E(decay): E(β <sup>+</sup> )=440 100 (1961Fi05) mag spect.

† Absolute intensity per 100 decays.

γ(<sup>116</sup>Sb)

I<sub>γ</sub> normalization: from I(γ+ce)=100 to g.s.; 1968Ki07 give I<sub>γ</sub>(94γ)=29% 1, from a ratio of γ's in an equilibrium <sup>116</sup>Te, <sup>116</sup>Sb source.

E <sub>γ</sub>	I <sub>γ</sub> ‡	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult.	α <sup>#</sup>	Comments
93.7 1	31.2 13	93.75	1 <sup>+</sup>	0.0	3 <sup>+</sup>	E2	2.07	α(K)=1.44; α(L)=0.50; α(M)=0.10 K:L:M=100 3:34.8 17:8.9 10 (1961Fi05) K/L: K:L:M=100 2:35.6 7:8.45 15 (1968Ra23).
103.0 1	1.87 10	103.02	2 <sup>+</sup>	0.0	3 <sup>+</sup>	M1	0.575	α(K)=0.496; α(L)=0.064; α(M)=0.073 α(K)exp=0.67 7 Mult.: α(K)exp deduced by 1981Mo10 from γ intensities and 1968Ra23 conversion electron measurements, if α(K)(93.7)=1.52. From ce data of 1961Fi05, 1981Mo10 deduce α(K)=0.47.
108.5 1	0.047 6	574.46	(2,3,4)	466.00	(3,4)			
157.2 1	0.41 2	731.70	1 <sup>+</sup>	574.46	(2,3,4)			I <sub>γ</sub> : I <sub>γ</sub> deduced from an intensity balance at the 575 level.

Continued on next page (footnotes at end of table)

$^{116}\text{Te}$   $\varepsilon$  decay **1981Mo10** (continued) $\gamma(^{116}\text{Sb})$  (continued)

$E_\gamma$	$I_\gamma^\ddagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
180.9	1	731.70	1 <sup>+</sup>	550.87	2 <sup>+</sup>	
363.0	1	466.00	(3,4)	103.02	2 <sup>+</sup>	
366.8	1	917.69	1 <sup>+</sup>	550.87	2 <sup>+</sup>	
447.8	1	550.87	2 <sup>+</sup>	103.02	2 <sup>+</sup>	
457.2	1	550.87	2 <sup>+</sup>	93.75	1 <sup>+</sup>	
466.0	1	466.00	(3,4)	0.0	3 <sup>+</sup>	$E_\gamma$ : not observed in Te $\varepsilon$ decay. $E_\gamma$ is from E(level) difference. $I_\gamma$ is based on $I_\gamma/I_\gamma(363\gamma)=0.12$ 2 in (p,n $\gamma$ ).
471.4	1	574.46	(2,3,4)	103.02	2 <sup>+</sup>	$E_\gamma$ : seen only in $\gamma\gamma$ .
480.6	1	574.46	(2,3,4)	93.75	1 <sup>+</sup>	
550.9	1	550.87	2 <sup>+</sup>	0.0	3 <sup>+</sup>	
574.5	1	574.46	(2,3,4)	0.0	3 <sup>+</sup>	
583.8	1	1158.29	1 <sup>+</sup>	574.46	(2,3,4)	
628.7	1	731.70	1 <sup>+</sup>	103.02	2 <sup>+</sup>	
637.9	2	731.70	1 <sup>+</sup>	93.75	1 <sup>+</sup>	
824.0	2	917.69	1 <sup>+</sup>	93.75	1 <sup>+</sup>	
917.7	2	917.69	1 <sup>+</sup>	0.0	3 <sup>+</sup>	
1055.3	2	1158.29	1 <sup>+</sup>	103.02	2 <sup>+</sup>	$I_\gamma$ : $I_\gamma$ from $I_\gamma/I_\gamma(584\gamma)=5.6$ 13 in (p,n $\gamma$ ).
1064.6	2	1158.29	1 <sup>+</sup>	93.75	1 <sup>+</sup>	$I_\gamma$ : $I_\gamma$ from $I_\gamma/I_\gamma(584\gamma)=2.2$ 6 in (p,n $\gamma$ ).

<sup>†</sup>  $I_\gamma$  derived from  $\gamma\gamma$ .

<sup>‡</sup> For absolute intensity per 100 decays, multiply by 1.06 5.

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

$^{116}\text{Te}$   $\epsilon$  decay 1981Mo10

Decay Scheme

Intensities:  $I_\gamma$  per 100 parent decays

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- Coincidence

$0^+ \xrightarrow{0.0} 0.0$  2.49 h 4  
 $Q_\epsilon = 1.55 \times 10^3$  3  
 $^{116}\text{Te}_{64}$

