

$^{120}\text{I}$   $\varepsilon$  decay (53 min)    [1970LaZT](#),[1970Ga32](#)

| Type            | Author                               | History | Citation           | Literature Cutoff Date |
|-----------------|--------------------------------------|---------|--------------------|------------------------|
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Parent:  $^{120}\text{I}$ :  $E=3.2\times 10^2$  15;  $J^\pi=(7^-)$ ;  $T_{1/2}=53$  min 4;  $Q(\varepsilon)=5615$  15;  $\% \varepsilon + \% \beta^+$  decay=100.0

[1970LaZT](#):  $\text{Te}(p,xn)$   $E=140$  MeV;  $\gamma$ ,  $\gamma\gamma$ .

[1970Ga32](#):  $\text{La,Ce}(p,xn)$   $E=660$  MeV;  $\gamma$ ,  $\beta$ ,  $\text{ce}$ ,  $\gamma\gamma$ .

[1988Br38](#): see general comment in 81.6-min  $^{120}\text{I}$   $\varepsilon$  decay.

Other: [1969Sp07](#).

The most extensive results are given by [1970LaZT](#), but the evaluators regard unpublished results as tentative. The evaluators note that there are discrepancies between the authors'  $\gamma$ -ray assignments and decay schemes.

The decay scheme is that proposed by [1970LaZT](#). States at 1863, 2083, 2835, and 3764 keV are ignored. Transitions assigned only by [1970LaZT](#) are regarded as tentative.

 $^{120}\text{Te}$  Levels

| $E(\text{level})^\dagger$ | $J^\pi^\ddagger$ |
|---------------------------|------------------|
| 0.0                       | $0^+$            |
| 560.4 3                   | $2^+$            |
| 1161.5 4                  | $4^+$            |
| 1201.5 <sup>#</sup> 4     | $2^+$            |
| 1776.2 5                  | $6^+$            |
| 1816.1 <sup>#</sup> 4     | $4^+$            |
| 2201.7 <sup>#</sup> 6     | $6^+$            |
| 2428.0 <sup>#</sup> 7     |                  |
| 2566.5 <sup>#</sup> 7     | $3^-, 4^-, 5^-$  |
| 3122.2 6                  |                  |

<sup>†</sup> From a least-squares fit to  $E(\gamma')$ s by the evaluators.

<sup>‡</sup> From Adopted Levels.

<sup>#</sup> Not reported by [1970Ga32](#).

 $\varepsilon, \beta^+$  radiations

$E\beta=3750$  150 from  $(600\gamma)(\beta^+$  to 1161.8 level) coin ([1968La18](#)). The evaluators note that assignment of the coin to  $^{120}\text{I}$  53-min decay is inconsistent with adopted feeding to 1162 level.

| $E(\text{decay})$      | $E(\text{level})$ | $I\beta^+^\dagger$ | $I\varepsilon^\dagger$ | $\text{Log } ft$ | $I(\varepsilon+\beta^+)^\dagger$ | Comments                                                                                                                                                                                                 |
|------------------------|-------------------|--------------------|------------------------|------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $(2.81\times 10^3$ 15) | 3122.2            | 8.2 25             | 11 3                   | 5.89 16          | 19 5                             | av $E\beta=802$ 69; $\varepsilon K=0.49$ 6; $\varepsilon L=0.064$ 8; $\varepsilon M+=0.0169$ 20                                                                                                          |
| $(3.51\times 10^3$ 15) | 2428.0?           | <0.25              | <0.12                  | >8.0             | <0.37                            | av $E\beta=1120$ 70; $\varepsilon K=0.28$ 4; $\varepsilon L=0.036$ 5; $\varepsilon M+=0.0096$ 13                                                                                                         |
| $(3.73\times 10^3$ 15) | 2201.7            | 2.3 6              | 0.86 25                | 7.24 15          | 3.2 8                            | av $E\beta=1225$ 70; $\varepsilon K=0.23$ 3; $\varepsilon L=0.030$ 4; $\varepsilon M+=0.0079$ 11                                                                                                         |
| $(4.16\times 10^3$ 15) | 1776.2            | 34 14              | 8 3                    | 6.36 20          | 42 17                            | av $E\beta=1423$ 71; $\varepsilon K=0.164$ 21; $\varepsilon L=0.021$ 3; $\varepsilon M+=0.0056$ 7<br>$E\beta=3130$ 150 from $(612\gamma)(\beta^+$ to 1776+1816 level) coin ( <a href="#">1968La18</a> ). |

<sup>†</sup> Absolute intensity per 100 decays.

$^{120}\text{I}$   $\varepsilon$  decay (53 min) [1970LaZT](#), [1970Ga32](#) (continued) $\gamma(^{120}\text{Te})$ 

$I_\gamma$  normalization: based on assumption of no  $\beta^-$  feedings to  $^{120}\text{Te}$  g.s. and adopted decay scheme.

$\gamma\gamma$ -coincidence results are from [1970LaZT](#).

Uncertain  $\gamma$ 's at 433 keV ([1970LaZT](#)) and 1665 keV ([1970Ga32](#)) are not adopted. Unplaced  $\gamma$ 's at 976, 1054, 1328 and 1443 keV in [1970Ga32](#) are also not adopted.

$I(\gamma^\pm)=61 \ 13$  ([1970LaZT](#)).

$\alpha(K)\text{exp}$  from [1970Ga32](#). Values are renormalized to  $\alpha(K)(E2)=0.00509$  for  $560\gamma$  by the evaluators.

| $E_\gamma$ <sup>†</sup>             | $I_\gamma$ <sup>†b</sup> | $E_i(\text{level})$ | $J_i^\pi$      | $E_f$   | $J_f^\pi$      | Mult. <sup>a</sup> | $\delta$ | $\alpha^c$ | Comments                                                                                                                                                                                                                     |
|-------------------------------------|--------------------------|---------------------|----------------|---------|----------------|--------------------|----------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 385                                 | 0.36 7                   | 2201.7              | 6 <sup>+</sup> | 1816.1  | 4 <sup>+</sup> |                    |          |            | $E_\gamma, I_\gamma$ : from <a href="#">1988Br38</a> . $\Delta I_\gamma$ is assumed as 20% by the evaluators.                                                                                                                |
| 425.7 5                             | 2.8 5                    | 2201.7              | 6 <sup>+</sup> | 1776.2  | 6 <sup>+</sup> | M1+E2              | +0.41 64 | 0.0139 4   | Mult.: from $(\alpha, 2n\gamma)$ .<br>$\delta$ : from $A_2$ of $\gamma(\theta)$ in low temperature oriented nuclei ( <a href="#">1988Br38</a> ).                                                                             |
| <sup>x</sup> 477.9 <sup>†#</sup> 5  | 1.2 3                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 485.1 <sup>†#</sup> 5  | 1.2 3                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| 560.4 3                             | 100 20                   | 560.4               | 2 <sup>+</sup> | 0.0     | 0 <sup>+</sup> | E2                 |          |            |                                                                                                                                                                                                                              |
| 601.1 3                             | 87 9                     | 1161.5              | 4 <sup>+</sup> | 560.4   | 2 <sup>+</sup> | E2                 |          | 0.00499    | $\alpha=0.00499$ ; $\alpha(K)=0.00423 \ 13$ ;<br>$\alpha(L)=0.00057 \ 2$<br>$\alpha(K)\text{exp}=0.0043$ ;<br>$\alpha(K)(E2)=0.00423$ ,<br>$\alpha(K)(M1)=0.00527$ .                                                         |
| 614.7 <sup>d</sup> 3                | 64 <sup>d</sup> 14       | 1776.2              | 6 <sup>+</sup> | 1161.5  | 4 <sup>+</sup> | E2                 |          | 0.00470    | $\alpha=0.00470$ ; $\alpha(K)=0.00399 \ 12$ ;<br>$\alpha(L)=0.00054 \ 2$<br>$\alpha(K)\text{exp}=0.0038$ ;<br>$\alpha(K)(M1)=0.00499$ ,<br>$\alpha(K)(E2)=0.00399$ .<br>$I_\gamma$ : uncertainty assigned by the evaluators. |
| 614.7 <sup>d</sup> 3                | 3.1 <sup>d</sup> 9       | 1816.1              | 4 <sup>+</sup> | 1201.5  | 2 <sup>+</sup> |                    |          |            | $I_\gamma$ : from $I(614\gamma)/I(654\gamma)=0.46/0.31$ ( <a href="#">1988Br38</a> ). Uncertainty is assumed by the evaluators based on that of $654\gamma$ .                                                                |
| 641.1 <sup>@</sup> 3                | 1.5 2                    | 1201.5              | 2 <sup>+</sup> | 560.4   | 2 <sup>+</sup> | M1+E2              | -2.4 16  | 0.0044 5   | $\alpha=0.0044 \ 5$ ; $\alpha(K)=0.0037 \ 5$ ;<br>$\alpha(L)=0.00049 \ 4$<br>$\delta$ : from $^{120}\text{I}$ $\varepsilon$ decay (81.6 min).                                                                                |
| 651.9 <sup>#</sup> 5                | 0.7 1                    | 2428.0?             |                | 1776.2  | 6 <sup>+</sup> |                    |          |            |                                                                                                                                                                                                                              |
| 654.5 5                             | 2.1 6                    | 1816.1              | 4 <sup>+</sup> | 1161.5  | 4 <sup>+</sup> | M1+E2              |          | 0.0045 5   | $\alpha=0.0045 \ 5$ ; $\alpha(K)=0.0038 \ 5$ ;<br>$\alpha(L)=0.00049 \ 4$                                                                                                                                                    |
| 694.4 <sup>#</sup> 7                | 0.56 20                  | 3122.2              |                | 2428.0? |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 703.9 5                | 1.9 4                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 874.7 <sup>†#</sup> 5  | 1.0 3                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 881.8 5                | 2.2                      |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| 921.3 <sup>e</sup> 4                | 4.3 5                    | 3122.2              |                | 2201.7  | 6 <sup>+</sup> |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 1031.5 6               | 1.5 3                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 1039.9 5               | 6.5 7                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 1059.2 5               | 5.1 5                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 1158.0 <sup>†#</sup> 6 | 2.7 5                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| <sup>x</sup> 1197.3 6               | 2.3 4                    |                     |                |         |                |                    |          |            |                                                                                                                                                                                                                              |
| 1201.6 <sup>@</sup> 5               | 0.33 6                   | 1201.5              | 2 <sup>+</sup> | 0.0     | 0 <sup>+</sup> |                    |          |            |                                                                                                                                                                                                                              |
| 1255.4 6                            | 0.7 2                    | 1816.1              | 4 <sup>+</sup> | 560.4   | 2 <sup>+</sup> |                    |          |            | $I_\gamma$ : from $I(1255\gamma)/I(654\gamma)=0.1/0.31$                                                                                                                                                                      |

Continued on next page (footnotes at end of table)

$^{120}\text{I}$   $\varepsilon$  decay (53 min) **1970LaZT,1970Ga32** (continued) $\gamma(^{120}\text{Te})$  (continued)

| $E_\gamma$ <sup>†</sup>              | $I_\gamma$ <sup>†b</sup> | $E_i(\text{level})$ | $J_i^\pi$                                      | $E_f$                 | $J_f^\pi$ | Mult. <sup>a</sup> | $\alpha$ <sup>c</sup> | Comments                                                                                                                                                                         |
|--------------------------------------|--------------------------|---------------------|------------------------------------------------|-----------------------|-----------|--------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                          |                     |                                                |                       |           |                    |                       | (1988Br38). Uncertainty of 10% is assigned by the evaluators.                                                                                                                    |
| <sup>x</sup> 1261.3 7                | 1.7 3                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 1302.7 7                | 0.95 2I                  |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 1334.6 7                | 4.4 9                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| 1345.9 4                             | 18.9 13                  | 3122.2              |                                                | 1776.2 6 <sup>+</sup> |           |                    |                       | $E_\gamma$ : other: 1348.0 15 (1970Ga32).<br>$\alpha(\text{K})_{\text{exp}}=0.0038$ .                                                                                            |
| 1405.0 5                             | 9.3 9                    | 2566.5              | 3 <sup>-</sup> ,4 <sup>-</sup> ,5 <sup>-</sup> | 1161.5 4 <sup>+</sup> | E1        |                    | 0.00033               | $\alpha=0.00033$ ; $\alpha(\text{K})=0.00029$ I<br>$\alpha(\text{K})_{\text{exp}}=0.000098$ ; $\alpha(\text{K})(\text{E1})=0.00029$ ,<br>$\alpha(\text{K})(\text{E2})=0.00062$ . |
| <sup>x</sup> 1441.1 <sup>‡#</sup> 10 | 1.3 3                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 1523.0 4                | 1.05 <sup>&amp;</sup> 10 |                     |                                                |                       |           | E1                 | 0.00025               | $\alpha=0.00025$ ; $\alpha(\text{K})=0.00025$ I                                                                                                                                  |
| <sup>x</sup> 1851.4 <sup>‡#</sup> 15 | 1.6 3                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 1868.3 <sup>‡</sup> 10  | 3.8 8                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 1922.8 <sup>‡#</sup> 15 | 2.0 4                    |                     |                                                |                       |           |                    |                       | $E_\gamma$ : assigned to $^{120}\text{I}$ decay (81.6 min) in<br>1970Ga32.                                                                                                       |
| <sup>x</sup> 1988.2 10               | 2.3 5                    |                     |                                                |                       |           |                    |                       | $I_\gamma$ : other: 0.7 (1970Ga32).                                                                                                                                              |
| <sup>x</sup> 2305.4 <sup>‡</sup> 20  | 2.0 4                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 2560.6 10               | 3.7 8                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 2864.3 <sup>‡</sup> 20  | 2.3 7                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |
| <sup>x</sup> 3105.1 <sup>‡</sup> 15  | 2.1 4                    |                     |                                                |                       |           |                    |                       |                                                                                                                                                                                  |

<sup>†</sup> From 1970LaZT, unless otherwise noted.<sup>‡</sup> Isomeric assignment uncertain (1970LaZT).

# Uncertain transition (1970LaZT).

@ From drawing of 1970LaZT. Uncertainty is assumed by the evaluators.

&amp; From intensity balance and branching ratio in 1988Br38. Uncertainty assigned by the evaluators.

<sup>a</sup> From  $\alpha(\text{K})_{\text{exp}}$  (1970Ga32).<sup>b</sup> For absolute intensity per 100 decays, multiply by 1.0 2.<sup>c</sup> 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.<sup>d</sup> Multiply placed with intensity suitably divided.<sup>e</sup> Placement of transition in the level scheme is uncertain.<sup>x</sup>  $\gamma$  ray not placed in level scheme.

$^{120}\text{I}$   $\epsilon$  decay (53 min) 1970LaZT,1970Ga32

## 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)  
 • Coincidence

## Decay Scheme

Intensities:  $I_{(\gamma+ce)}$  per 100 parent decays  
 @ Multiply placed: intensity suitably divided

