

¹⁷⁰Tm(n,γ) E=thermal **1994Sc51,1966Sh03**

| Type | Author | History | Citation | Literature Cutoff Date |
|-----------------|----------------------------------|---------|---------------------|------------------------|
| Full Evaluation | Coral M. Baglin, E. A. Mccutchan | | NDS 151, 334 (2018) | 30-Jun-2018 |

J^π(¹⁷⁰Tm)=1⁻.

1994Sc51: GAMS1 and GAMS2/3 bent-crystal spectrometers; measured (over a period of several weeks) E_γ, I_γ following double-neutron capture in ¹⁶⁹Tm target. ¹⁷¹Tm transitions distinguished from ¹⁷⁰Tm(129 d) transitions based on their increase in intensity as a function of time.

1966Sh03: studied ¹⁷⁰Tm levels populated by ¹⁶⁹Tm(n,γ) E=thermal; observed well-known γ rays in ¹⁷¹Tm (double neutron capture product): 111.6γ, 124.0γ, 210.6γ, 308.5γ.

¹⁷¹Tm Levels

| E(level) [‡] | J ^π [†] | E(level) [‡] | J ^π [†] | E(level) [‡] | J ^π [†] | E(level) [‡] | J ^π [†] |
|--------------------------|-----------------------------|------------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|
| 0.0 [#] | 1/2 ⁺ | 347.9604 [#] 23 | 11/2 ⁺ | 737.730 ^a 6 | (5/2) ⁺ | 912.947 ^c 3 | 5/2 ⁺ |
| 5.0362 [#] 11 | 3/2 ⁺ | 424.9559 [@] 15 | 7/2 ⁻ | 750.127 ^b 6 | (5/2) ⁻ | 998.625 ^c 3 | (7/2) ⁺ |
| 116.6568 [#] 10 | 5/2 ⁺ | 520.3188 [@] 18 | (9/2) ⁻ | 754.841 ^b 5 | (1/2) ⁻ | 1036.40 ^b 4 | (7/2) ⁻ |
| 129.0543 [#] 12 | 7/2 ⁺ | 635.5394 ^{&} 19 | 7/2 ⁺ | 822.345 ^a 5 | (7/2) ⁺ | 1284.967 ^d 4 | (5/2) ⁺ |
| 326.8109 [#] 14 | 9/2 ⁺ | 675.788 ^a 5 | 3/2 ⁺ | 884.318 ^b 12 | (3/2) ⁻ | | |

[†] From Adopted Levels.

[‡] From least-squares fit to E_γ by evaluators. Normalized χ² of 3.1 exceeds critical value of 2.1.

[#] Band(A): 1/2[411] band.

[@] Band(B): 7/2[523] band.

[&] Band(C): 7/2[404] band.

^a Band(D): 3/2[411] band.

^b Band(E): 1/2[541] band.

^c Band(F): 5/2[402] band.

^d Band(G): 5/2[413] band.

γ(¹⁷¹Tm)

| E _γ [†] | I _γ [†] | E _i (level) | J _i ^π | E _f | J _f ^π |
|---------------------------------------|-----------------------------|------------------------|-----------------------------|----------------|-----------------------------|
| 85.6782 11 | 1.4 4 | 998.625 | (7/2) ⁺ | 912.947 | 5/2 ⁺ |
| 95.363 1 | 3.1 6 | 520.3188 | (9/2) ⁻ | 424.9559 | 7/2 ⁻ |
| 111.6200 5 | 46.2 8 | 116.6568 | 5/2 ⁺ | 5.0362 | 3/2 ⁺ |
| 115.224 5 | 1.2 4 | 635.5394 | 7/2 ⁺ | 520.3188 | (9/2) ⁻ |
| 116.6570 10 | 6.4 4 | 116.6568 | 5/2 ⁺ | 0.0 | 1/2 ⁺ |
| ^x 117.0570 [‡] 19 | 1.53 24 | | | | |
| 124.0184 4 | 36.2 21 | 129.0543 | 7/2 ⁺ | 5.0362 | 3/2 ⁺ |
| ^x 185.006 [‡] 4 | 2.6 4 | | | | |
| 197.7596 11 | 12.7 5 | 326.8109 | 9/2 ⁺ | 129.0543 | 7/2 ⁺ |
| 210.1504 12 | 6.6 5 | 326.8109 | 9/2 ⁺ | 116.6568 | 5/2 ⁺ |
| 210.5832 13 | 53.2 13 | 635.5394 | 7/2 ⁺ | 424.9559 | 7/2 ⁻ |
| 218.9060 19 | 4.4 4 | 347.9604 | 11/2 ⁺ | 129.0543 | 7/2 ⁺ |
| 277.4072 20 | 13.1 11 | 912.947 | 5/2 ⁺ | 635.5394 | 7/2 ⁺ |
| 295.9010 12 | 29.9 16 | 424.9559 | 7/2 ⁻ | 129.0543 | 7/2 ⁺ |
| 308.2996 16 | 63 4 | 424.9559 | 7/2 ⁻ | 116.6568 | 5/2 ⁺ |
| ^x 333.5704 [‡] 16 | 7.2 11 | | | | |
| 372.0200 17 | 7.0 6 | 1284.967 | (5/2) ⁺ | 912.947 | 5/2 ⁺ |

Continued on next page (footnotes at end of table)

¹⁷⁰Tm(n,γ) E=thermal 1994Sc51,1966Sh03 (continued)

γ(¹⁷¹Tm) (continued)

| <u>E_γ[†]</u> | <u>I_γ[†]</u> | <u>E_i(level)</u> | <u>J_i^π</u> | <u>E_f</u> | <u>J_f^π</u> | <u>Comments</u> |
|---------------------------------------|----------------------------------|-----------------------------|----------------------------------|----------------------|----------------------------------|---|
| ^x 399.623 [‡] 8 | 4.1 14 | | | | | |
| ^x 440.167 [‡] 3 | 9.86 27 | | | | | |
| ^x 460.4640 [‡] 21 | 15.9 5 | | | | | |
| ^x 468.473 [‡] 3 | 14.9 6 | | | | | |
| ^x 477.030 [‡] 4 | 16.3 13 | | | | | |
| 495.63 3 | 2.1 4 | 822.345 | (7/2 ⁺) | 326.8109 | 9/2 ⁺ | |
| ^x 497.294 [‡] 6 | 9.4 12 | | | | | |
| ^x 499.0397 [‡] 26 | 63.4 9 | | | | | |
| ^x 505.344 [‡] 5 | 22.5 14 | | | | | |
| ^x 518.069 [‡] 9 | 4.52 22 | | | | | |
| ^x 531.967 [‡] 4 | 14.8 8 | | | | | |
| ^x 539.025 [‡] 16 | 7.7 3 | | | | | |
| ^x 559.201 8 | 8.12 24 | | | | | |
| ^x 561.323 [‡] 13 | 10.5 8 | | | | | |
| ^x 574.106 [‡] 6 | 17.6 7 | | | | | |
| ^x 586.429 20 | 5.0 8 | | | | | E _γ : indicated As a placed transition In table 1 of 1994Sc51, but not included In level scheme In fig. 1. |
| ^x 604.660 13 | 15.3 7 | | | | | E _γ : indicated As a placed transition In table 1 of 1994Sc51, but not included In level scheme In fig. 1. |
| ^x 608.168 [‡] 14 | 7.5 26 | | | | | |
| ^x 620.638 [‡] 4 | 19 7 | | | | | |
| 621.073 @ 6 | 24 @ 3 | 737.730 | (5/2 ⁺) | 116.6568 | 5/2 ⁺ | |
| 621.073 @ 6 | 24 @ 3 | 750.127 | (5/2 ⁻) | 129.0543 | 7/2 ⁺ | |
| ^x 644.442 [‡] 11 | 7.5 25 | | | | | |
| ^x 648.731 [‡] 3 | 69.5 13 | | | | | |
| ^x 664.897 [‡] 5 | 60.2 12 | | | | | |
| ^x 666.627 [‡] 11 | 12.9 5 | | | | | |
| 670.760 # 9 | 29 15 | 675.788 | 3/2 ⁺ | 5.0362 | 3/2 ⁺ | |
| 675.782 6 | 34 20 | 675.788 | 3/2 ⁺ | 0.0 | 1/2 ⁺ | |
| 693.287 # 4 | 85 6 | 822.345 | (7/2 ⁺) | 129.0543 | 7/2 ⁺ | |
| ^x 694.100 [‡] 21 | 19 15 | | | | | |
| 705.75 4 | 9.3 19 | 822.345 | (7/2 ⁺) | 116.6568 | 5/2 ⁺ | |
| ^x 708.701 [‡] 8 | 50.6 8 | | | | | |
| ^x 714.438 [‡] 13 | 14.4 8 | | | | | |
| ^x 717.363 [‡] 7 | 42.8 12 | | | | | |
| 732.66 4 | 10.5 6 | 737.730 | (5/2 ⁺) | 5.0362 | 3/2 ⁺ | |
| 745.071 19 | 31 14 | 750.127 | (5/2 ⁻) | 5.0362 | 3/2 ⁺ | |
| 749.808 6 | 13 12 | 754.841 | (1/2 ⁻) | 5.0362 | 3/2 ⁺ | |
| 754.827 9 | 17 7 | 754.841 | (1/2 ⁻) | 0.0 | 1/2 ⁺ | |
| ^x 757.071 [‡] 21 | 15.0 7 | | | | | E _γ : from 1996Ho12; E _γ =757.01 21 given In 1994Sc51 is presumed to be a misprint. |
| 767.655 12 | 33 10 | 884.318 | (3/2 ⁻) | 116.6568 | 5/2 ⁺ | |
| ^x 774.86 [‡] 4 | 5.2 3 | | | | | |
| ^x 776.207 [‡] 16 | 14.4 6 | | | | | E _γ : from 1996Ho12; E _γ =776.20 16 given In 1994Sc51 is presumed to be a misprint. |
| ^x 786.204 [‡] 14 | 16.6 7 | | | | | |
| ^x 788.391 [‡] 18 | 24.0 5 | | | | | |
| ^x 793.952 [‡] 14 | 26.3 10 | | | | | |

Continued on next page (footnotes at end of table)

$^{170}\text{Tm}(n,\gamma)$ E=thermal **1994Sc51,1966Sh03** (continued) $\gamma(^{171}\text{Tm})$ (continued)

| E_γ^\dagger | I_γ^\dagger | $E_i(\text{level})$ | J_i^π | E_f | J_f^π | Comments |
|---------------------------------------|--------------------|---------------------|--------------------|----------|------------------|---|
| 796.282 13 | 28.8 24 | 912.947 | 5/2 ⁺ | 116.6568 | 5/2 ⁺ | |
| ^x 831.13 4 | 7.3 19 | | | | | |
| ^x 852.870 [‡] 19 | 32.3 7 | | | | | |
| ^x 872.44 [‡] 4 | 21.1 9 | | | | | |
| 881.95 6 | 6.6 9 | 998.625 | (7/2) ⁺ | 116.6568 | 5/2 ⁺ | |
| 884.34 3 | 35 10 | 884.318 | (3/2) ⁻ | 0.0 | 1/2 ⁺ | |
| ^x 890.021 [‡] 27 | 28.4 10 | | | | | |
| ^x 895.376 [‡] 19 | 26.6 13 | | | | | |
| | | | | | | E_γ : from 1996Ho12 ; $E_\gamma=895.386$ 20 given In 1994Sc51 is presumed to have been revised In 1996Ho12 . |
| ^x 897.21 [‡] 4 | 8.0 15 | | | | | |
| ^x 899.137 [‡] 20 | 18.4 15 | | | | | |
| ^x 907.833 18 | 13 8 | | | | | |
| ^x 916.139 [‡] 15 | 36.2 9 | | | | | |
| 919.74 4 | 19.1 10 | 1036.40 | (7/2) ⁻ | 116.6568 | 5/2 ⁺ | |
| ^x 933.63 [‡] 8 | 8.6 24 | | | | | |
| ^x 938.40 [‡] 5 | 19.2 11 | | | | | |
| ^x 939.66 [‡] 3 | 23.8 8 | | | | | |
| ^x 940.94 [‡] 3 | 19.5 17 | | | | | |
| ^x 941.85 [‡] 4 | 20.6 23 | | | | | |
| ^x 945.97 [‡] 4 | 11.8 20 | | | | | |
| ^x 947.80 [‡] 3 | 16.0 12 | | | | | |
| ^x 964.329 [‡] 18 | 30.6 10 | | | | | |
| ^x 965.85 3 | 21.9 10 | | | | | |
| ^x 967.280 [‡] 15 | 53.0 15 | | | | | |
| ^x 973.087 [‡] 19 | 34.6 12 | | | | | |
| ^x 980.02 [‡] 4 | 17.9 11 | | | | | |
| ^x 1035.251 [‡] 21 | 46.3 19 | | | | | |
| ^x 1036.51 [‡] 4 | 18.6 12 | | | | | |
| ^x 1050.08 [‡] 5 | 18.8 16 | | | | | |
| ^x 1095.01 [‡] 8 | 20.8 12 | | | | | |
| ^x 1212.99 [‡] 6 | 32.1 18 | | | | | |
| ^x 1220.76 9 | 32 4 | | | | | |

[†] From [1994Sc51](#). I_γ corrected by authors for self absorption in target. The authors note that some of these γ rays may belong to ^{170}Tm . In fact, almost all of the unplaced transitions are listed among the transitions reported for ^{170}Tm from the same experiment (see [1996Ho12](#)), and these are noted In this table.

[‡] Reported among ^{170}Tm transitions In [1996Ho12](#) (data from same experiment), so probably does not belong In ^{171}Tm .

This γ is also placed in ^{170}Tm ; see [1996Ho12](#).

@ Multiply placed with undivided intensity.

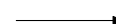


^x γ ray not placed in level scheme.

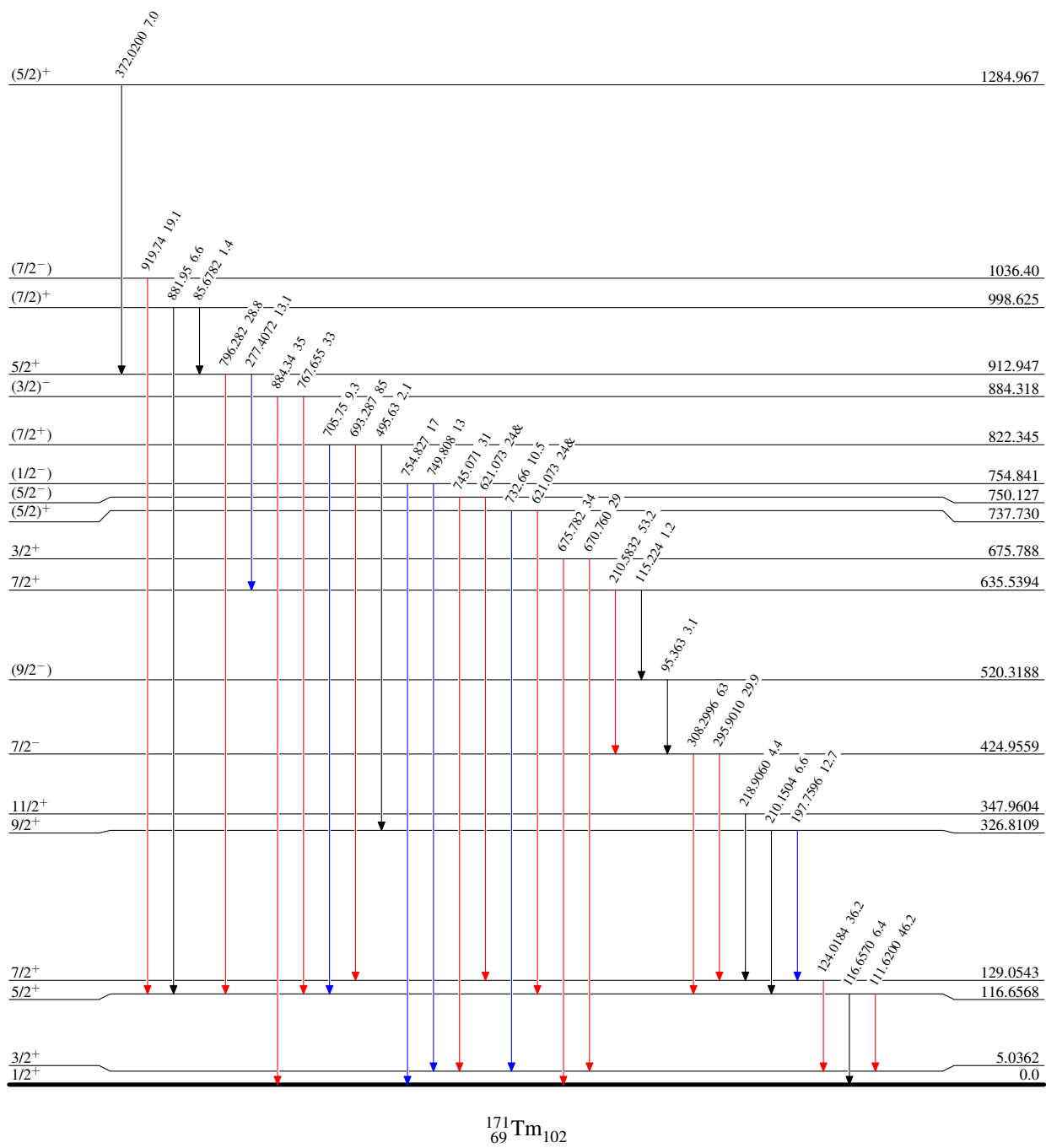
$^{170}\text{Tm}(n,\gamma)$ E=thermal 1994Sc51,1966Sh03

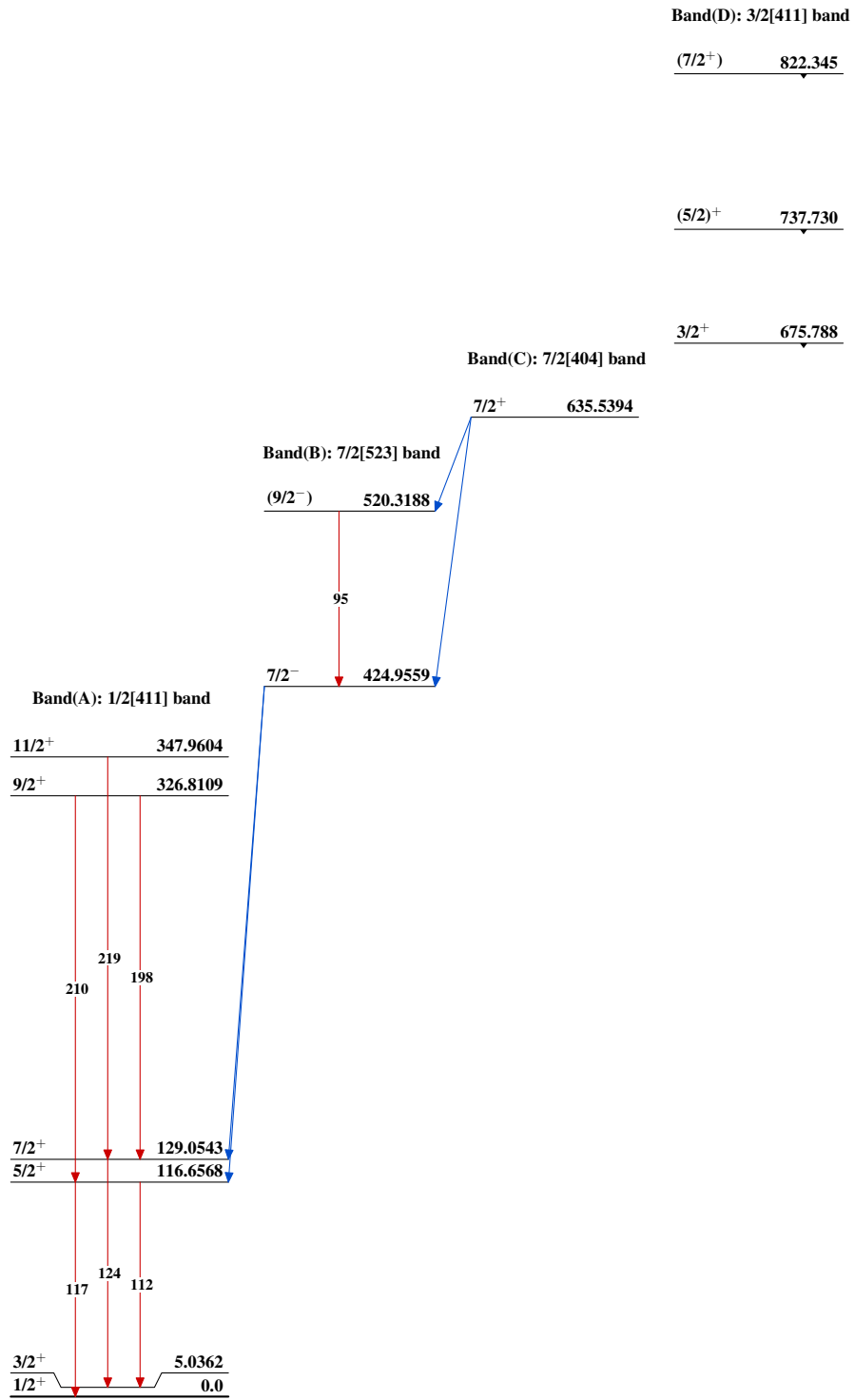
Level Scheme

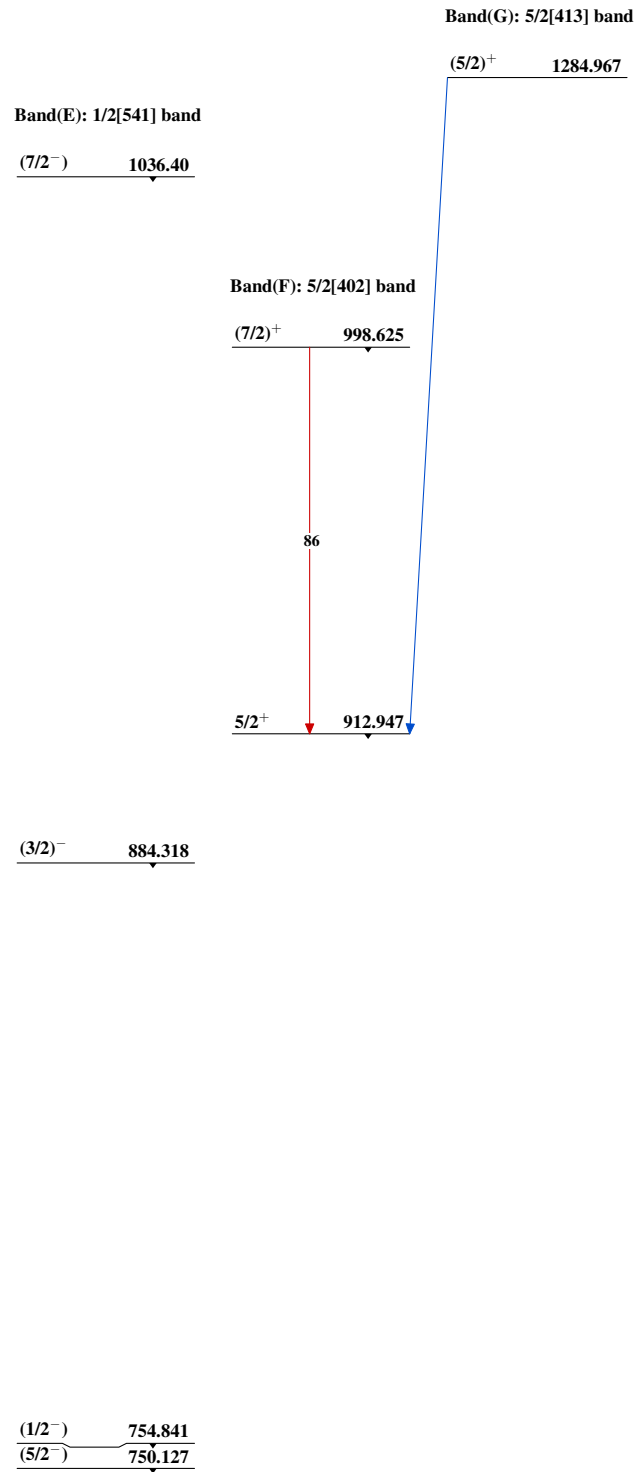
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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



$^{170}\text{Tm}(n,\gamma)$ E=thermal 1994Sc51,1966Sh03 $^{171}_{69}\text{Tm}_{102}$

$^{170}\text{Tm}(n,\gamma) E=\text{thermal}$ 1994Sc51,1966Sh03 (continued) $^{171}_{69}\text{Tm}_{102}$