

**<sup>248</sup>Cm SF decay 2016Ur01**

| Type            | Author   | History Citation  | Literature Cutoff Date |
|-----------------|----------|-------------------|------------------------|
| Full Evaluation | Jun Chen | NDS 146, 1 (2017) | 30-Sep-2017            |

Parent: <sup>248</sup>Cm: E=0.0; J<sup>π</sup>=0<sup>+</sup>; T<sub>1/2</sub>=3.48×10<sup>5</sup> y 6; %SF decay=?

<sup>248</sup>Cm-T<sub>1/2</sub>: From Adopted Levels of <sup>248</sup>Cm.

**2016Ur01:** The <sup>248</sup>Cm source was made of potassium chloride mixed with 5 mg of curium oxide. Prompt γ rays following spontaneous fission of <sup>248</sup>Cm were detected with the EUROGAM2 array in Strasbourg, consisting of 52 large Ge detectors including 24 four-crystal CLOVER detectors and X rays and low-energy γ rays were detected with four LEPS detectors. Measured Eγ, Iγ, γγ-coin, γγγ-coin, γγ(θ). Deduced levels, J, π, bands, mixing ratios. Comparisons with shell-model calculations.

**1999Ho30:** <sup>138</sup>Te nuclei were produced as secondary fragments in the spontaneous fission of <sup>248</sup>Cm. γ rays were detected with the EUROGAM II array of 52 Compton-suppressed Ge detectors including 24 four-crystal CLOVER detectors and 4 low-energy photon spectrometers. Measured Eγ, γγ-coin. Deduced levels, J, π, band structure.

<sup>138</sup>Te Levels

| E(level) <sup>†</sup>   | J <sup>π</sup> <sup>‡</sup>    | E(level) <sup>†</sup>   | J <sup>π</sup> <sup>‡</sup>    | E(level) <sup>†</sup>       | J <sup>π</sup> <sup>‡</sup> | E(level) <sup>†</sup>     | J <sup>π</sup> <sup>‡</sup> |
|-------------------------|--------------------------------|-------------------------|--------------------------------|-----------------------------|-----------------------------|---------------------------|-----------------------------|
| 0.0 <sup>#</sup>        | 0 <sup>+</sup>                 | 1774.20 25              | 5 <sup>+</sup> ,6 <sup>+</sup> | 2199.68 <sup>&amp;</sup> 19 | 8 <sup>+</sup>              | 3068.74 <sup>@</sup> 23   | (11 <sup>+</sup> )          |
| 461.10 <sup>#</sup> 10  | 2 <sup>+</sup>                 | 1863.21 25              | 5 <sup>+</sup> ,6 <sup>+</sup> | 2534.1 5                    | (7,8 <sup>+</sup> )         | 3208.9 <sup>&amp;</sup> 3 | (12 <sup>+</sup> )          |
| 904.30 <sup>#</sup> 15  | 4 <sup>+</sup>                 | 2021.79 <sup>@</sup> 23 | 7 <sup>+</sup>                 | 2588.99 <sup>@</sup> 21     | (9 <sup>+</sup> )           | 3471.8 <sup>@</sup> 4     | (13 <sup>+</sup> )          |
| 1439.80 <sup>#</sup> 18 | 6 <sup>+</sup>                 | 2089.00 <sup>#</sup> 20 | 8 <sup>+</sup>                 | 2673.90 <sup>&amp;</sup> 21 | (10 <sup>+</sup> )          | 3743.3 <sup>&amp;</sup> 4 | (14 <sup>+</sup> )          |
| 1617.4 4                | 3 <sup>+</sup> ,4 <sup>+</sup> | 2152.0 4                | (5,6 <sup>+</sup> )            | 2760.79 <sup>#</sup> 20     | 10 <sup>+</sup>             | 4471.5 <sup>&amp;</sup> 5 |                             |

<sup>†</sup> From least-squares fit to γ-ray energies.

<sup>‡</sup> As given by **2016Ur01** based on γγ(θ), γ-ray intensity pattern and systematics of N=86 nuclei.

<sup>#</sup> Band(A): Band 1, yrast band.

<sup>@</sup> Band(B): Band 2, γ band.

<sup>&</sup> Band(C): Band 3.

γ(<sup>138</sup>Te)

Quoted values of A<sub>2</sub> and A<sub>4</sub> are determined from a spectrum being a sum of γ spectra gated on lines in the cascade below the line of interest, except for 461.1γ and 535.5γ, with a gate only on 443.2γ (**2016Ur01**).

| E <sub>γ</sub> <sup>†</sup> | I <sub>γ</sub> <sup>†</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> | Comments   |
|-----------------------------|-----------------------------|------------------------|-----------------------------|----------------|-----------------------------|--------------------|----------------|--|
| 110.6 2                     | 2.4 3                       | 2199.68                | 8 <sup>+</sup>              | 2089.00        | 8 <sup>+</sup>              |                    |                |  |
| 139.9 3                     | 0.6 2                       | 3208.9                 | (12 <sup>+</sup> )          | 3068.74        | (11 <sup>+</sup> )          |                    |                |  |
| 177.8 2                     | 1.8 4                       | 2199.68                | 8 <sup>+</sup>              | 2021.79        | 7 <sup>+</sup>              |                    |                |  |
| 262.8 2                     | 2.6 4                       | 3471.8                 | (13 <sup>+</sup> )          | 3208.9         | (12 <sup>+</sup> )          |                    |                |  |
| 271.5 2                     | 1.8 4                       | 3743.3                 | (14 <sup>+</sup> )          | 3471.8         | (13 <sup>+</sup> )          |                    |                |  |
| 308.0 2                     | 3.4 4                       | 3068.74                | (11 <sup>+</sup> )          | 2760.79        | 10 <sup>+</sup>             | (M1+E2)            | 0.25 9         | A <sub>2</sub> =+0.075 43, A <sub>4</sub> =+0.0159 70. |
| 389.3 1                     | 3.5 4                       | 2588.99                | (9 <sup>+</sup> )           | 2199.68        | 8 <sup>+</sup>              | (M1+E2)            | 0.10 3         | A <sub>2</sub> =+0.010 19, A <sub>4</sub> =+0.016 31.  |
| 394.8 3                     | 0.7 3                       | 3068.74                | (11 <sup>+</sup> )          | 2673.90        | (10 <sup>+</sup> )          |                    |                |  |
| 403.5 4                     | 1.0 3                       | 3471.8                 | (13 <sup>+</sup> )          | 3068.74        | (11 <sup>+</sup> )          |                    |                |  |
| 443.2 <sup>‡</sup> 1        | 85 7                        | 904.30                 | 4 <sup>+</sup>              | 461.10         | 2 <sup>+</sup>              | E2                 |                |  |
| 461.1 <sup>‡</sup> 1        | 100 3                       | 461.10                 | 2 <sup>+</sup>              | 0.0            | 0 <sup>+</sup>              | E2                 |                | A <sub>2</sub> =+0.101 8, A <sub>4</sub> =+0.032 15.   |
| 474.2 2                     | 1.8 3                       | 2673.90                | (10 <sup>+</sup> )          | 2199.68        | 8 <sup>+</sup>              |                    |                |  |
| 479.7 2                     | 3.0 3                       | 3068.74                | (11 <sup>+</sup> )          | 2588.99        | (9 <sup>+</sup> )           |                    |                |  |
| 534.5 4                     | 0.5 3                       | 3743.3                 | (14 <sup>+</sup> )          | 3208.9         | (12 <sup>+</sup> )          |                    |                |  |
| 535.0 4                     | 3 1                         | 3208.9                 | (12 <sup>+</sup> )          | 2673.90        | (10 <sup>+</sup> )          |                    |                | A <sub>2</sub> =+0.107 10, A <sub>4</sub> =-0.016 18.  |

Continued on next page (footnotes at end of table)

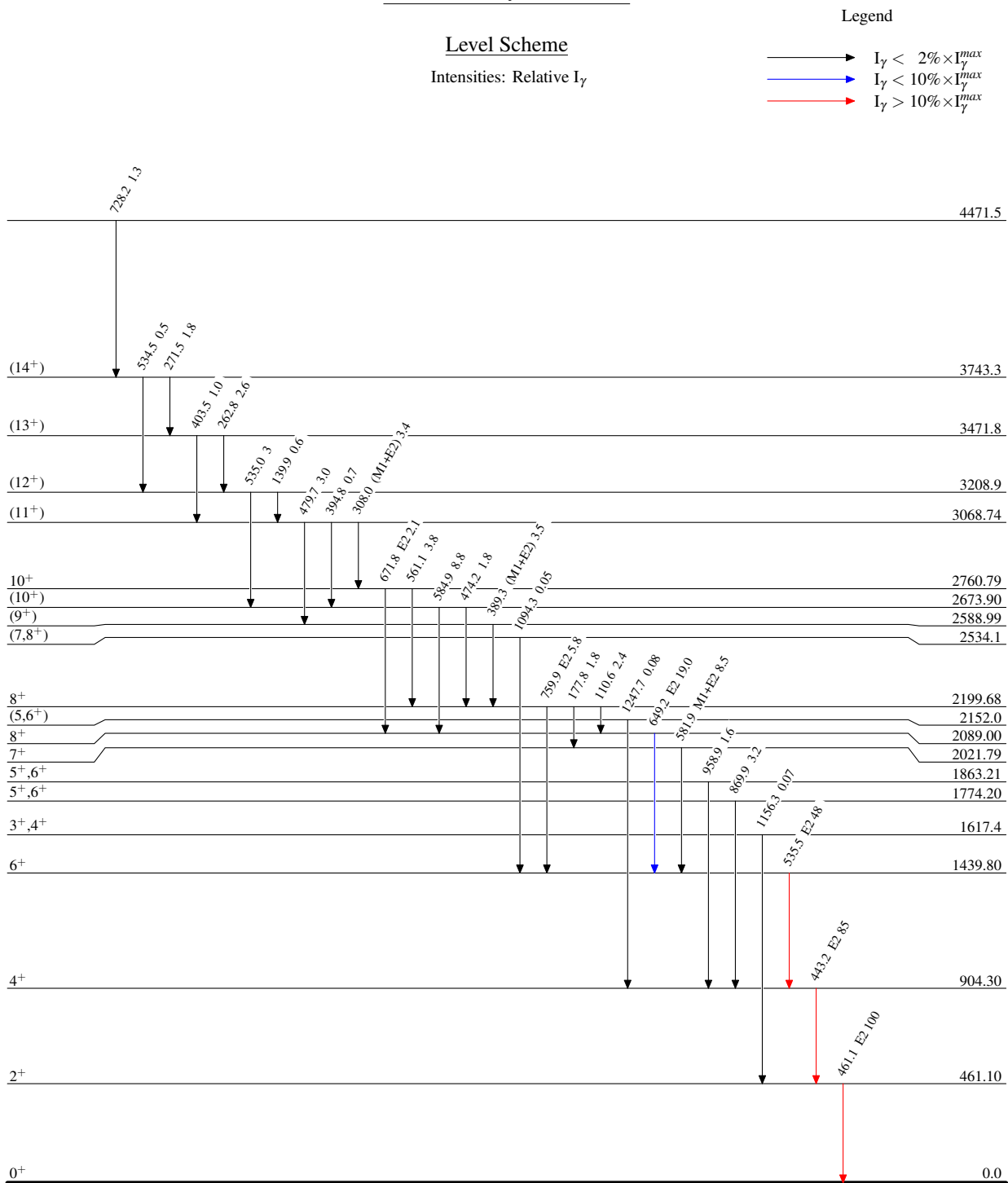
**$^{248}\text{Cm}$  SF decay 2016Ur01 (continued)** $\gamma(^{138}\text{Te})$  (continued)

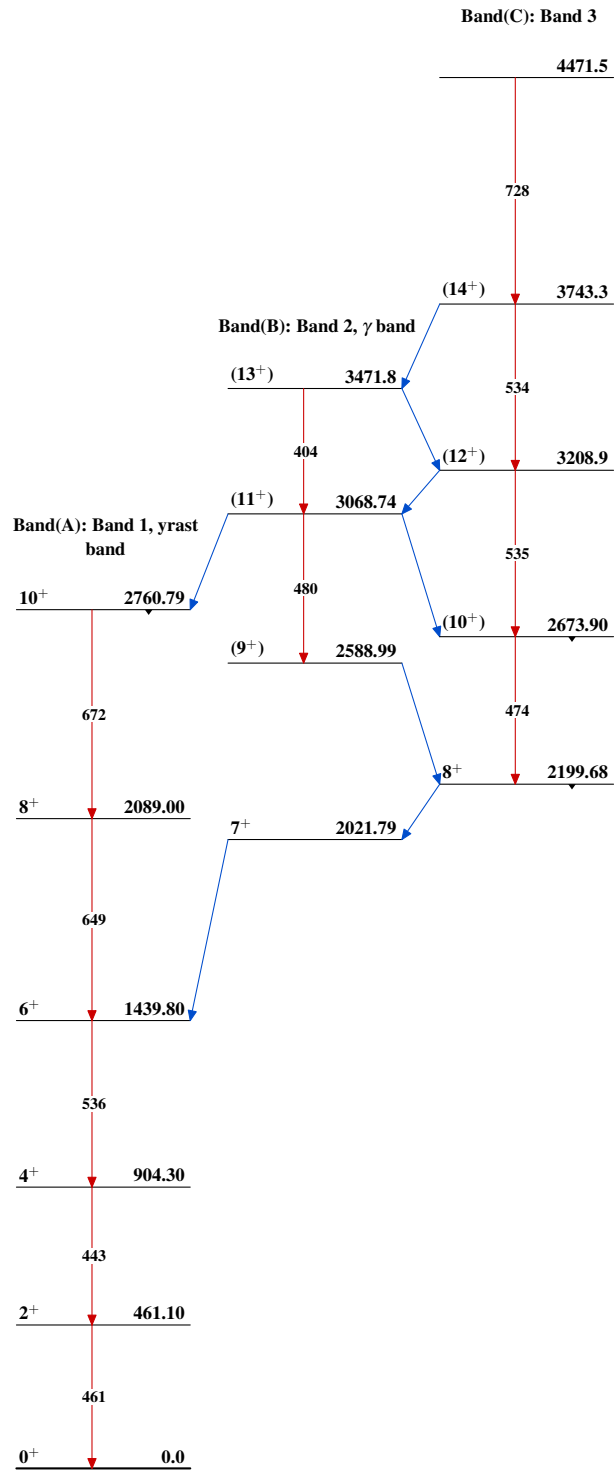
| $E_\gamma^\dagger$ | $I_\gamma^\dagger$ | $E_i(\text{level})$ | $J_i^\pi$                      | $E_f$   | $J_f^\pi$          | Mult. # | $\delta^\#$ | Comments  |
|--------------------|--------------------|---------------------|--------------------------------|---------|--------------------|---------|-------------|---|
| 535.5 1            | 48 5               | 1439.80             | 6 <sup>+</sup>                 | 904.30  | 4 <sup>+</sup>     | E2      |             |   |
| 561.1 1            | 3.8 3              | 2760.79             | 10 <sup>+</sup>                | 2199.68 | 8 <sup>+</sup>     |         |             |   |
| 581.9 2            | 8.5 7              | 2021.79             | 7 <sup>+</sup>                 | 1439.80 | 6 <sup>+</sup>     | M1+E2   | 0.11 3      | $A_2=-0.002$ 19, $A_4=+0.017$ 28.   |
| 584.9 1            | 8.8 7              | 2673.90             | (10 <sup>+</sup> )             | 2089.00 | 8 <sup>+</sup>     |         |             |   |
| 649.2 1            | 19.0 9             | 2089.00             | 8 <sup>+</sup>                 | 1439.80 | 6 <sup>+</sup>     | E2      |             | $A_2=+0.099$ 19, $A_4=+0.015$ 30. Other: $A_2=+0.128$ 34, $A_4=+0.034$ 52, for gate on 443.2 $\gamma$ (2016Ur01). |
| 671.8 1            | 2.1 4              | 2760.79             | 10 <sup>+</sup>                | 2089.00 | 8 <sup>+</sup>     | E2      |             | $A_2=+0.118$ 71, $A_4=-0.001$ 118.  |
| 728.2 3            | 1.3 4              | 4471.5              |                                | 3743.3  | (14 <sup>+</sup> ) |         |             |   |
| 759.9 1            | 5.8 3              | 2199.68             | 8 <sup>+</sup>                 | 1439.80 | 6 <sup>+</sup>     | E2      |             | $A_2=+0.102$ 31, $A_4=+0.031$ 49.   |
| 869.9 2            | 3.2 4              | 1774.20             | 5 <sup>+</sup> ,6 <sup>+</sup> | 904.30  | 4 <sup>+</sup>     |         |             | $A_2=+0.215$ 35, $A_4=-0.067$ 65.<br>$\delta=-0.1$ 1 for J=5 (2016Ur01).  |
| 958.9 2            | 1.6 4              | 1863.21             | 5 <sup>+</sup> ,6 <sup>+</sup> | 904.30  | 4 <sup>+</sup>     |         |             |   |
| 1094.3 4           | 0.05 2             | 2534.1              | (7,8 <sup>+</sup> )            | 1439.80 | 6 <sup>+</sup>     |         |             |   |
| 1156.3 3           | 0.07 3             | 1617.4              | 3 <sup>+</sup> ,4 <sup>+</sup> | 461.10  | 2 <sup>+</sup>     |         |             |   |
| 1247.7 3           | 0.08 2             | 2152.0              | (5,6 <sup>+</sup> )            | 904.30  | 4 <sup>+</sup>     |         |             |   |

<sup>†</sup> From 2016Ur01.

<sup>‡</sup> 461.1 $\gamma$  and 443.2 $\gamma$  are placed in reversed order by 1999Ho30, making a level at 443.2 instead of the level at 460.8.

<sup>#</sup> From 2016Ur01 based on measured  $\gamma\gamma(\theta)$ . Since no direct experimental evidence for the assigned polarities, brackets are added around E2 or M1+E1 when considered in Adopted Levels, Gammas.

$^{248}\text{Cm}$  SF decay 2016Ur01 $^{138}_{52}\text{Te}_{86}$

$^{248}\text{Cm}$  SF decay 2016Ur01 $^{138}_{52}\text{Te}_{86}$