

<sup>252</sup>Cf SF decay 2004Jo17,1997Do20

| Type            | Author  | History Citation | Literature Cutoff Date |
|-----------------|---------|------------------|------------------------|
| Full Evaluation | N. Nica | NDS 195,1 (2024) | 19-Sep-2023            |

Parent: <sup>252</sup>Cf: E=0.0; T<sub>1/2</sub>=2.645 y 8; %SF decay=?

2004Jo17: used a 62 μCi source of <sup>252</sup>Cf in the Gammasphere array, consisting of 102 Ge detectors. Measured γγγ coin. E<sub>γ</sub> given only on the proposed level scheme.

1997Do20: studied γ rays from a <sup>252</sup>Cf SF source using 72 large-volume Compton-suppressed Ge detectors and 2 x-ray detectors in the Gammasphere array, as well as a variety of detectors at other laboratories. Measured x-x, x-γ, γ-γ, x-γ-γ, and γ-γ-γ coincidences.

2013Cz02: <sup>252</sup>Cf SF decay: measured E<sub>γ</sub>, I<sub>γ</sub>, γγγ coin, γγ(θ) using Gammasphere array. Several known E<sub>γ</sub>'s from <sup>162</sup>Gd are measured together with transitions in the studied nuclide, <sup>86</sup>Se. <sup>162</sup>Gd is the most pronounced complementary fission fragment to <sup>86</sup>Se in spontaneous fission of <sup>252</sup>Cf.

The studies of 2004Jo17 and 1997Do20 involve many of the same authors. 1997Do20 report members of a putative g.s. band up to a probable 14<sup>+</sup> state. 2004Jo17 confirm this level scheme and extend it up to the 16<sup>+</sup> member. In a conference proceedings, 2005Jo24 present some of the same information, but give no γ-ray and level-energy data.

<sup>162</sup>Gd Levels

| E(level) <sup>†</sup> | J <sup>π</sup> <sup>‡</sup> |
|-----------------------|-----------------------------|
| 0.0 <sup>#</sup>      | 0 <sup>+</sup>              |
| 71.6 <sup>#</sup>     | 2 <sup>+</sup>              |
| 236.4 <sup>#</sup>    | 4 <sup>+</sup>              |
| 490.0 <sup>#</sup>    | 6 <sup>+</sup>              |
| 826.2 <sup>#</sup>    | 8 <sup>+</sup>              |
| 1237.9 <sup>#</sup>   | 10 <sup>+</sup>             |
| 1718.6 <sup>#</sup>   | 12 <sup>+</sup>             |
| 2260.2 <sup>#</sup>   | 14 <sup>+</sup>             |
| 2857.1 <sup>#</sup>   | 16 <sup>+</sup>             |

<sup>†</sup> Values reported by 2004Jo17 from the listed E<sub>γ</sub> values.

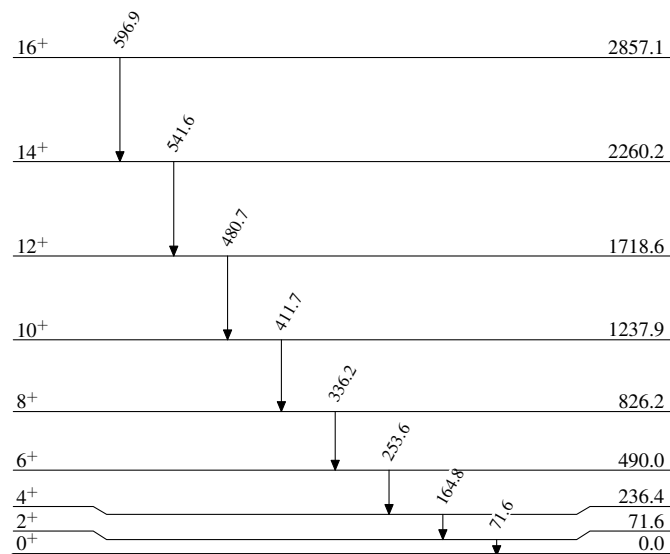
<sup>‡</sup> Authors' values based on the spins of expected g.s.-band members.

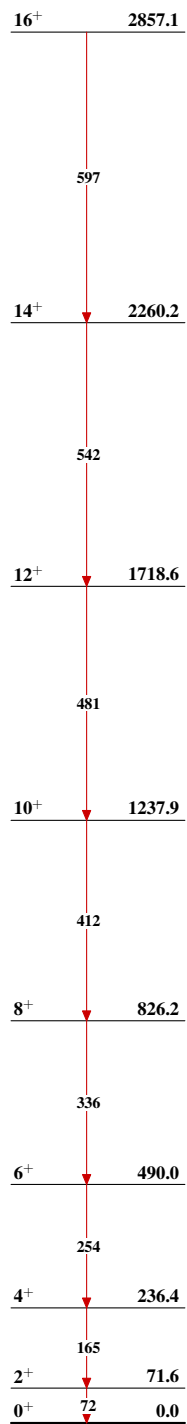
<sup>#</sup> Band(A): K<sup>π</sup>=0<sup>+</sup> g.s. band.

γ(<sup>162</sup>Gd)

| E <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> | Comments                                  |
|-----------------------------|------------------------|-----------------------------|----------------|-----------------------------|---|
| 71.6                        | 71.6                   | 2 <sup>+</sup>              | 0.0            | 0 <sup>+</sup>              |   |
| 164.8                       | 236.4                  | 4 <sup>+</sup>              | 71.6           | 2 <sup>+</sup>              | E <sub>γ</sub> : Other: 164.9 (2013Cz02). |
| 253.6                       | 490.0                  | 6 <sup>+</sup>              | 236.4          | 4 <sup>+</sup>              | E <sub>γ</sub> : Other: 253.5 (2013Cz02). |
| 336.2                       | 826.2                  | 8 <sup>+</sup>              | 490.0          | 6 <sup>+</sup>              | E <sub>γ</sub> : Other: 335.9 (2013Cz02). |
| 411.7                       | 1237.9                 | 10 <sup>+</sup>             | 826.2          | 8 <sup>+</sup>              | E <sub>γ</sub> : Other: 411.5 (2013Cz02). |
| 480.7                       | 1718.6                 | 12 <sup>+</sup>             | 1237.9         | 10 <sup>+</sup>             |   |
| 541.6                       | 2260.2                 | 14 <sup>+</sup>             | 1718.6         | 12 <sup>+</sup>             |   |
| 596.9                       | 2857.1                 | 16 <sup>+</sup>             | 2260.2         | 14 <sup>+</sup>             |   |

<sup>†</sup> From 2004Jo17. Except for the 71- and 164-keV γ's (which differ by ≈0.6 keV), these values are in essential agreement with those of 1997Do20. Both sets of data are shown on the proposed level schemes only.

$^{252}\text{Cf}$  SF decay 2004Jo17,1997Do20Level Scheme $^{162}_{64}\text{Gd}_{98}$

$^{252}\text{Cf}$  SF decay 2004Jo17,1997Do20Band(A):  $K^\pi=0^+$  g.s.  
band $^{162}_{64}\text{Gd}_{98}$