

$^{144}\text{Sm}(\text{d,p}),(\text{d,p}\gamma)$  1975Bo22,1967Ch16

| Type            | Author                | History             | Citation | Literature Cutoff Date |
|-----------------|-----------------------|---------------------|----------|------------------------|
| Full Evaluation | E. Browne, J. K. Tuli | NDS 110, 507 (2009) |          | 1-Oct-2008             |

E=19 MeV (1975Bo22), 12 MeV (1967Ch16,1965Ke09), 15 MeV (1966Jo02), 5.8 MeV (1974No05).

Measured:  $\sigma(E,\theta)$ , DWBA analysis (1975Bo22,1974No05,1967Ch16,1966Jo02),  $\sigma(E)$  (1965Ke09),  $p\gamma$  coin (1967Ch16).

 $^{145}\text{Sm}$  Levels

E( $\alpha$ ),S( $\alpha$ ) Observed only by 1965Ke09; relative  $\sigma$  ( $\sigma=100$  for g.s.).

| E(level) <sup>†</sup> | J $\pi^{\ddagger}$ | L   | S'        | Comments                                                                                                                                                                                                                                                                                       |
|-----------------------|--------------------|-----|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.0                   | 7/2 <sup>-</sup>   | 3   | 6.82      |                                                                                                                                                                                                                                                                                                |
| 895.0 7               | 3/2 <sup>-</sup>   | 1   | 2.13      |                                                                                                                                                                                                                                                                                                |
| 1108.0 10             | 13/2 <sup>+</sup>  | 6   | 6.44      |                                                                                                                                                                                                                                                                                                |
| 1427.0 10             | 9/2 <sup>-</sup>   | 5   | 6.41      | L: 1966Jo02 also report a weak component with L=1·S'=0.06 but it is not supported by others.                                                                                                                                                                                                   |
| 1611.0 12             | 1/2 <sup>-</sup>   | 1   | 1.26      |                                                                                                                                                                                                                                                                                                |
| 1665.0 8              | 5/2 <sup>-</sup>   | 3   | 1.25      |                                                                                                                                                                                                                                                                                                |
| 1784 8                | 9/2 <sup>-</sup>   | 5   | 3.19      | E(level): 1966Jo02 observed level 1800 with weak L=1·S'=0.03 component.                                                                                                                                                                                                                        |
| 1810 8                | 5/2 <sup>+</sup>   |     | 4.6       | J $\pi$ : if identical with 1804.26 5/2 <sup>+</sup> level observed in $\varepsilon$ decay.                                                                                                                                                                                                    |
| 1854? 9               |                    |     |           | J $\pi$ : observed L=1 and J=1/2 <sup>-</sup> ,3/2 <sup>-</sup> (1975Bo22,1967Ch16); not consistent with J=7/2 <sup>+</sup> ( $^{145}\text{Eu}$ $\varepsilon$ decay) and with absence of primary $\gamma$ to this level from 1/2 <sup>+</sup> thermal neutron capture state in (n, $\gamma$ ). |
|                       |                    |     |           | E(level): this level was not observed by 1966Jo02.                                                                                                                                                                                                                                             |
| 1883 8                | 7/2 <sup>-</sup>   | 3   | 0.67      |                                                                                                                                                                                                                                                                                                |
| 1979.0 8              | 3/2 <sup>-</sup>   | 1   | 0.53      |                                                                                                                                                                                                                                                                                                |
| 2002.0 10             | 5/2 <sup>-</sup>   | 3   | 2.03      |                                                                                                                                                                                                                                                                                                |
| 2112 14               |                    |     | 1.5       |                                                                                                                                                                                                                                                                                                |
| 2138.0 8              | 3/2 <sup>-</sup>   | 1   | 0.14      |                                                                                                                                                                                                                                                                                                |
| 2164 9                | 1/2 <sup>-</sup>   | 1   | 0.15      |                                                                                                                                                                                                                                                                                                |
| 2199 16               |                    |     | 1         |                                                                                                                                                                                                                                                                                                |
| 2297 9                | 9/2 <sup>+</sup>   | 4   | 0.18      |                                                                                                                                                                                                                                                                                                |
| 2349 10               | 5/2 <sup>-</sup>   | 3   | 0.22      |                                                                                                                                                                                                                                                                                                |
| 2390 10               |                    |     | 4.6       |                                                                                                                                                                                                                                                                                                |
| 2429 10               | 5/2 <sup>-</sup>   | 3   | 0.43      |                                                                                                                                                                                                                                                                                                |
| 2488 15               |                    |     | 1.5       |                                                                                                                                                                                                                                                                                                |
| 2512 15               |                    |     | 1         |                                                                                                                                                                                                                                                                                                |
| 2563 11               |                    |     | 5         |                                                                                                                                                                                                                                                                                                |
| 2629 15               |                    |     | 4         |                                                                                                                                                                                                                                                                                                |
| 2661 17               |                    |     | 2         |                                                                                                                                                                                                                                                                                                |
| 2674 10               |                    | 1+6 | 0.21,3.55 | E(level): from 1975Bo22.                                                                                                                                                                                                                                                                       |
| 2724 16               |                    |     | 2         |                                                                                                                                                                                                                                                                                                |
| 2750 18               |                    |     | 1.5       |                                                                                                                                                                                                                                                                                                |
| 2797 12               |                    |     | <13       |                                                                                                                                                                                                                                                                                                |
| 2824 14               |                    |     | <13       |                                                                                                                                                                                                                                                                                                |
| 2842 19               |                    |     | <13       |                                                                                                                                                                                                                                                                                                |
| 2926 13               |                    |     | 4.5       |                                                                                                                                                                                                                                                                                                |
| 2960 16               |                    |     | 2         |                                                                                                                                                                                                                                                                                                |
| 3018 13               |                    |     | 20        |                                                                                                                                                                                                                                                                                                |
| 3096 10               | 5/2 <sup>-</sup>   | 3   | 0.55      | E(level): from 1975Bo22.                                                                                                                                                                                                                                                                       |
| 3131 10               | 3/2 <sup>-</sup>   | 1   | 0.27      | E(level): from 1975Bo22.                                                                                                                                                                                                                                                                       |
| 3183 15               |                    |     |           |                                                                                                                                                                                                                                                                                                |
| 3246 20               |                    |     | 5         |                                                                                                                                                                                                                                                                                                |
| 3275 20               |                    |     | 3         |                                                                                                                                                                                                                                                                                                |
| 3302 13               |                    |     | 18        |                                                                                                                                                                                                                                                                                                |

Continued on next page (footnotes at end of table)

**$^{144}\text{Sm}(\text{d,p}),(\text{d,p}\gamma)$     [1975Bo22,1967Ch16](#) (continued)** $^{145}\text{Sm}$  Levels (continued)

| <u>E(level)<sup>†</sup></u> | <u>S'</u> | <u>E(level)<sup>†</sup></u> | <u>S'</u> | <u>E(level)<sup>†</sup></u> | <u>S'</u> | <u>E(level)<sup>†</sup></u> | <u>S'</u> |
|-----------------------------|-----------|-----------------------------|-----------|-----------------------------|-----------|-----------------------------|-----------|
| 3335 17                     | 5         | 3506 20                     | 3         | 3679 14                     | 20        | 3916 20                     | 11        |
| 3366 14                     | 20        | 3534 20                     | 2         | 3726 14                     | 8         | 4010 20                     | 2         |
| 3397 14                     | <48       | 3558 14                     | 18        | 3783 15                     | 17        | 4027 15                     | 24        |
| 3433 17                     | <48       | 3596 14                     |           | 3833 15                     | 14        |                             |           |
| 3446 20                     | <48       | 3633 21                     |           | 3856 21                     | 3         |                             |           |
| 3480 20                     | 9         | 3655 21                     |           | 3882 15                     | 17        |                             |           |

<sup>†</sup> From [1965Ke09](#).<sup>‡</sup> Adopted values. $\gamma(^{145}\text{Sm})$ From [1967Ch16](#), E<sub>γ</sub> deduced from E(level) by evaluator.

| <u>E<sub>γ</sub></u> | <u>E<sub>i</sub>(level)</u> | <u>J<sub>i</sub><sup>π</sup></u> | <u>E<sub>f</sub></u> | <u>J<sub>f</sub><sup>π</sup></u> | <u>E<sub>γ</sub></u> | <u>E<sub>i</sub>(level)</u> | <u>J<sub>i</sub><sup>π</sup></u> | <u>E<sub>f</sub></u> | <u>J<sub>f</sub><sup>π</sup></u> |
|----------------------|-----------------------------|----------------------------------|----------------------|----------------------------------|----------------------|-----------------------------|----------------------------------|----------------------|----------------------------------|
| 716                  | 1611.0                      | 1/2 <sup>-</sup>                 | 895.0                | 3/2 <sup>-</sup>                 | 1427                 | 1427.0                      | 9/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 |
| 770                  | 1665.0                      | 5/2 <sup>-</sup>                 | 895.0                | 3/2 <sup>-</sup>                 | 1665                 | 1665.0                      | 5/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 |
| 895                  | 895.0                       | 3/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 | 1979                 | 1979.0                      | 3/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 |
| 1084                 | 1979.0                      | 3/2 <sup>-</sup>                 | 895.0                | 3/2 <sup>-</sup>                 | 2002                 | 2002.0                      | 5/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 |
| 1108                 | 1108.0                      | 13/2 <sup>+</sup>                | 0.0                  | 7/2 <sup>-</sup>                 | 2138                 | 2138.0                      | 3/2 <sup>-</sup>                 | 0.0                  | 7/2 <sup>-</sup>                 |
| 1243                 | 2138.0                      | 3/2 <sup>-</sup>                 | 895.0                | 3/2 <sup>-</sup>                 |                      |                             |                                  |                      |                                  |

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## Level Scheme

