

$^{96}\text{Zr}(^3\text{He},2n\gamma)$  1987Ca04

| Type            | Author  | History<br>Citation | Literature Cutoff Date |
|-----------------|---------|---------------------|------------------------|
| Full Evaluation | N. Nica | NDS 111, 525 (2010) | 19-Nov-2009            |

$E(^3\text{He})=11$  MeV; measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ ,  $\gamma(\theta)$ ,  $\gamma(\text{pol})$ , excit;Ge(Li) detectors.

 $^{97}\text{Mo}$  Levels

| E(level) | $J^\pi$ <sup>†</sup> | Comments                                                                                          |
|----------|----------------------|---------------------------------------------------------------------------------------------------|
| 0.0      | $5/2^+$              |                                                                                                   |
| 480.9    | $3/2^+$              |                                                                                                   |
| 658.2    | $7/2^+$              |                                                                                                   |
| 679.5    | $1/2^+$              | $J^\pi$ : $J=1/2$ or $3/2$ from 679.5 $\gamma$ excit.                                             |
| 719.4    | $5/2^+$              | $J^\pi$ : $J<9/2$ from 238.4 $\gamma$ excit.                                                      |
| 721.1    | $3/2^+$              |                                                                                                   |
| 888.0    | $1/2^+$              | $J^\pi$ : $J=1/2$ or $3/2$ from 407.0 $\gamma$ excit.                                             |
| 1024.4   | $7/2^+$              |                                                                                                   |
| 1092.2   | $3/2^+$              |                                                                                                   |
| 1116.6   | $9/2^+$              |                                                                                                   |
| 1267?    |                      |                                                                                                   |
| 1268.3   | $7/2^+$              | $J^\pi$ : $J=3/2$ , $5/2$ or $7/2$ from 1268.3 $\gamma$ excit.                                    |
| 1270.8   | $5/2^+$              | $J^\pi$ : $J<9/2$ from 790.0 $\gamma$ excit.                                                      |
| 1284.5   | $3/2^+, 5/2^+$       |                                                                                                   |
| 1409.6   | $11/2^+$             | $J^\pi$ : $J=9/2$ , $11/2$ from 751.4 $\gamma$ excit.                                             |
| 1437.0   | $11/2^-$             |                                                                                                   |
| 1512.8   |                      |                                                                                                   |
| 1515.5   | $9/2^+$              | $J^\pi$ : $J=9/2$ from 1515.5 $\gamma$ excit.                                                     |
| 1556.3   | $5/2^-, 7/2^-$       |                                                                                                   |
| 1565.5   | $(7/2)$              | $J^\pi$ : $J=7/2$ or $9/2$ from 1565.5 $\gamma$ excit.                                            |
| 1627.3   | $7/2^+$              |                                                                                                   |
| 1692.0   |                      |                                                                                                   |
| 1697.6   | $(9/2^+)$            |                                                                                                   |
| 1782.8   | $(11/2^+)$           | $J^\pi$ : $7/2$ , $9/2$ , $11/2$ from 666.2 $\gamma$ excit; $\geq 9/2$ from 758.4 $\gamma$ excit. |
| 1865.0   |                      |                                                                                                   |
| 1909.0   |                      |                                                                                                   |
| 1921.0   | $13/2^+$             |                                                                                                   |
| 1940.0   | $(5/2^+)$            |                                                                                                   |
| 2002.8   | $15/2^-$             | $J^\pi$ : $J>9/2$ from 565.8 $\gamma$ excit.                                                      |
| 2040.8   | $(9/2, 11/2)$        | $J^\pi$ : $J>9/2$ from 924.2 $\gamma$ excit.                                                      |
| 2073.6   |                      |                                                                                                   |
| 2197.3   |                      |                                                                                                   |
| 2244.0   |                      | $J^\pi$ : $J>9/2$ from 1127.4 $\gamma$ excit.                                                     |
| 2258.1   | $(9/2, 11/2)$        | $J^\pi$ : $J\leq 11/2$ from 821.1 $\gamma$ excit.                                                 |
| 2271.0   |                      |                                                                                                   |
| 2357.4   |                      |                                                                                                   |
| 2434.0   | $(15/2^+)$           |                                                                                                   |
| 2627.0   |                      |                                                                                                   |
| 2708.0   |                      |                                                                                                   |
| 2725.6   |                      |                                                                                                   |
| 2813.2   |                      |                                                                                                   |

<sup>†</sup> From Adopted Levels.

$^{96}\text{Zr}(^3\text{He}, 2n\gamma)$  **1987Ca04** (continued)

| $\gamma(^{97}\text{Mo})$ |                    |                     |                                     |        |                      |       | Comments                                                                                                        |
|--------------------------|--------------------|---------------------|-------------------------------------|--------|----------------------|-------|-----------------------------------------------------------------------------------------------------------------|
| $E_\gamma$               | $I_\gamma$         | $E_i(\text{level})$ | $J_i^\pi$                           | $E_f$  | $J_f^\pi$            | Mult. |                                                                                                                 |
| 238.4 3                  | 19 1               | 719.4               | 5/2 <sup>+</sup>                    | 480.9  | 3/2 <sup>+</sup>     |       | $\delta: +0.01 \leq \delta \leq +0.07$ , $\Delta J = -1$ from $\gamma(\theta)$ , $\gamma(\text{pol})$ .         |
| 247.2 3                  | 16 2               | 1515.5              | 9/2 <sup>+</sup>                    | 1268.3 | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 320.4 3                  | 65 2               | 1437.0              | 11/2 <sup>-</sup>                   | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 366.1 3                  | 3 1                | 1024.4              | 7/2 <sup>+</sup>                    | 658.2  | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 397.4 <sup>†</sup> 3     | 2 <sup>†</sup> 1   | 1116.6              | 9/2 <sup>+</sup>                    | 719.4  | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 407.0 3                  | 9 1                | 888.0               | 1/2 <sup>+</sup>                    | 480.9  | 3/2 <sup>+</sup>     |       | $E_\gamma$ : assigned to 1545 level in $(\alpha, n\gamma)$ and $(n, n'\gamma)$ data sets.                       |
| 428.1 3                  | 5 1                | 1865.0              |                                     | 1437.0 | 11/2 <sup>-</sup>    |       |                                                                                                                 |
| 458.3 3                  | 3 1                | 1116.6              | 9/2 <sup>+</sup>                    | 658.2  | 7/2 <sup>+</sup>     |       | $I_\gamma$ : contaminated by $^{97}\text{Nb}$ decay.<br>Mult.: $\Delta J \neq 0, \pm 2$ from $\gamma(\theta)$ . |
| 480.9 <sup>†</sup> 3     | 102 <sup>†</sup> 2 | 480.9               | 3/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 547 <sup>†</sup>         | 4 <sup>†</sup> 1   | 1267?               |                                     | 719.4  | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 548.9 <sup>†</sup> 3     | 4 <sup>†</sup> 1   | 1268.3              | 7/2 <sup>+</sup>                    | 719.4  | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 558.1 <sup>†</sup> 3     | 2 <sup>†</sup> 1   | 2073.6              |                                     | 1515.5 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 565.8 3                  | 20 2               | 2002.8              | 15/2 <sup>-</sup>                   | 1437.0 | 11/2 <sup>-</sup>    |       |                                                                                                                 |
| 658.2 3                  | 1000 52            | 658.2               | 7/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 666.2 3                  | 7 1                | 1782.8              | (11/2 <sup>+</sup> )                | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 679.5 3                  | 17 1               | 679.5               | 1/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 705.5 <sup>††</sup> 3    | 2 <sup>††</sup> 1  | 2271.0              |                                     | 1565.5 | (7/2)                |       |                                                                                                                 |
| 705.5 <sup>††</sup> 3    | 1 <sup>††</sup> 1  | 2708.0              |                                     | 2002.8 | 15/2 <sup>-</sup>    |       |                                                                                                                 |
| 719.4 <sup>†</sup> 3     | 43 <sup>†</sup> 2  | 719.4               | 5/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 721.1 <sup>†</sup> 3     | 34 <sup>†</sup> 1  | 721.1               | 3/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 722.8 <sup>†</sup> 3     | 2 <sup>†</sup> 1   | 2725.6              |                                     | 2002.8 | 15/2 <sup>-</sup>    |       |                                                                                                                 |
| 751.4 <sup>†</sup> 3     | 62 <sup>†</sup> 4  | 1409.6              | 11/2 <sup>+</sup>                   | 658.2  | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 758.4 3                  | 10 1               | 1782.8              | (11/2 <sup>+</sup> )                | 1024.4 | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 778.2 <sup>†</sup> 3     | 7 <sup>†</sup> 2   | 1437.0              | 11/2 <sup>-</sup>                   | 658.2  | 7/2 <sup>+</sup>     |       | (M1+E2) $\delta: +0.08 \leq \delta \leq +0.25$ , $\Delta J = -1$ from $\gamma(\theta)$ , $\gamma(\text{pol})$ . |
| 787.4 <sup>††</sup> 3    | 7 <sup>††</sup> 1  | 1268.3              | 7/2 <sup>+</sup>                    | 480.9  | 3/2 <sup>+</sup>     |       |                                                                                                                 |
| 787.4 <sup>††</sup> 3    | 3 <sup>††</sup> 1  | 2197.3              |                                     | 1409.6 | 11/2 <sup>+</sup>    |       |                                                                                                                 |
| 790.0 <sup>†</sup> 3     | 9 <sup>†</sup> 1   | 1270.8              | 5/2 <sup>+</sup>                    | 480.9  | 3/2 <sup>+</sup>     |       |                                                                                                                 |
| 796.3 3                  | 4 1                | 1515.5              | 9/2 <sup>+</sup>                    | 719.4  | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 803.6 <sup>†</sup> 3     | 4 <sup>†</sup> 1   | 1284.5              | 3/2 <sup>+</sup> , 5/2 <sup>+</sup> | 480.9  | 3/2 <sup>+</sup>     |       |                                                                                                                 |
| 804.0 <sup>†</sup> 3     | 4 <sup>†</sup> 1   | 1692.0              |                                     | 888.0  | 1/2 <sup>+</sup>     |       |                                                                                                                 |
| 804.4 <sup>†</sup> 3     | 26 <sup>†</sup> 3  | 1921.0              | 13/2 <sup>+</sup>                   | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 821.1 3                  | 8 1                | 2258.1              | (9/2, 11/2)                         | 1437.0 | 11/2 <sup>-</sup>    |       |                                                                                                                 |
| 823.4 3                  | 3 1                | 1940.0              | (5/2 <sup>+</sup> )                 | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 836.9 <sup>†</sup> 3     | 6 <sup>†</sup> 1   | 1556.3              | 5/2 <sup>-</sup> , 7/2 <sup>-</sup> | 719.4  | 5/2 <sup>+</sup>     |       | $E_\gamma$ : assigned to 1321 level in $(\alpha, n\gamma)$ and $(n, n'\gamma)$ data sets.                       |
| 840.6 <sup>†</sup> 3     | 6 <sup>†</sup> 1   | 1865.0              |                                     | 1024.4 | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 843.4 <sup>†</sup> 3     | 1 <sup>†</sup> 1   | 2627.0              |                                     | 1782.8 | (11/2 <sup>+</sup> ) |       | Mult.: $\Delta J \neq -2$ from $\gamma(\theta)$ .                                                               |
| 854.6 3                  | 7 2                | 1512.8              |                                     | 658.2  | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 892.6 3                  | 2 1                | 2813.2              |                                     | 1921.0 | 13/2 <sup>+</sup>    |       |                                                                                                                 |
| 907.9 <sup>†</sup> 3     | 2 <sup>†</sup> 1   | 1627.3              | 7/2 <sup>+</sup>                    | 719.4  | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 924.2 3                  | 4 1                | 2040.8              | (9/2, 11/2)                         | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 947.8 <sup>†</sup> 3     | 1 <sup>†</sup> 1   | 2357.4              |                                     | 1409.6 | 11/2 <sup>+</sup>    |       |                                                                                                                 |
| 1024.4 <sup>††</sup> 3   | 73 <sup>††</sup> 4 | 1024.4              | 7/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 1024.4 <sup>††</sup> 3   | 8 <sup>††</sup> 1  | 2434.0              | (15/2 <sup>+</sup> )                | 1409.6 | 11/2 <sup>+</sup>    |       |                                                                                                                 |
| 1039.4 <sup>†</sup> 3    | 16 <sup>†</sup> 2  | 1697.6              | (9/2 <sup>+</sup> )                 | 658.2  | 7/2 <sup>+</sup>     |       |                                                                                                                 |
| 1080.9 <sup>†</sup> 3    | 3 <sup>†</sup> 1   | 2197.3              |                                     | 1116.6 | 9/2 <sup>+</sup>     |       |                                                                                                                 |
| 1092.2 3                 | 21 2               | 1092.2              | 3/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |
| 1116.6 3                 | 171 2              | 1116.6              | 9/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>     |       |                                                                                                                 |

Continued on next page (footnotes at end of table)

$^{96}\text{Zr}(^3\text{He},2n\gamma)$     **1987Ca04** (continued) $\gamma(^{97}\text{Mo})$  (continued)

| $E_\gamma$            | $I_\gamma$        | $E_i(\text{level})$ | $J_i^\pi$                           | $E_f$  | $J_f^\pi$         | Comments                                                                                       |
|-----------------------|-------------------|---------------------|-------------------------------------|--------|-------------------|------------------------------------------------------------------------------------------------|
| 1127.4 <sup>†</sup> 3 | 3 <sup>†</sup> 1  | 2244.0              |                                     | 1116.6 | 9/2 <sup>+</sup>  |                                                                                                |
| 1148.0 <sup>†</sup> 3 | 5 <sup>†</sup> 1  | 1627.3              | 7/2 <sup>+</sup>                    | 480.9  | 3/2 <sup>+</sup>  |                                                                                                |
| 1189.3 <sup>†</sup> 3 | 2 <sup>†</sup> 1  | 1909.0              |                                     | 719.4  | 5/2 <sup>+</sup>  | $E_\gamma$ : assigned to 1847.8 level in (n,n' $\gamma$ ) data set.                            |
| 1217.4 3              | 1 1               | 2627.0              |                                     | 1409.6 | 11/2 <sup>+</sup> |                                                                                                |
| 1251.0 <sup>†</sup> 3 | 2 <sup>†</sup> 1  | 1909.0              |                                     | 658.2  | 7/2 <sup>+</sup>  | $E_\gamma$ : assigned to 1930.2 level in (n,n' $\gamma$ ) data set.                            |
| 1268.3 <sup>†</sup> 3 | 24 <sup>†</sup> 2 | 1268.3              | 7/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>  |                                                                                                |
| 1270.8 3              | 6 1               | 1270.8              | 5/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>  |                                                                                                |
| 1281.6 <sup>†</sup> 3 | 3 <sup>†</sup> 1  | 1940.0              | (5/2 <sup>+</sup> )                 | 658.2  | 7/2 <sup>+</sup>  | Mult.: $\Delta J=0, -2$ from $\gamma(\theta)$ (assignment tentative because of contamination). |
| 1284.5 3              | 8 1               | 1284.5              | 3/2 <sup>+</sup> , 5/2 <sup>+</sup> | 0.0    | 5/2 <sup>+</sup>  |                                                                                                |
| 1515.5 3              | 16 2              | 1515.5              | 9/2 <sup>+</sup>                    | 0.0    | 5/2 <sup>+</sup>  |                                                                                                |
| 1565.5 3              | 21 1              | 1565.5              | (7/2)                               | 0.0    | 5/2 <sup>+</sup>  |                                                                                                |

<sup>†</sup> Contaminated by unresolved lines from other nuclei. Intensity corrected for contamination.

<sup>‡</sup> Multiply placed with intensity suitably divided.

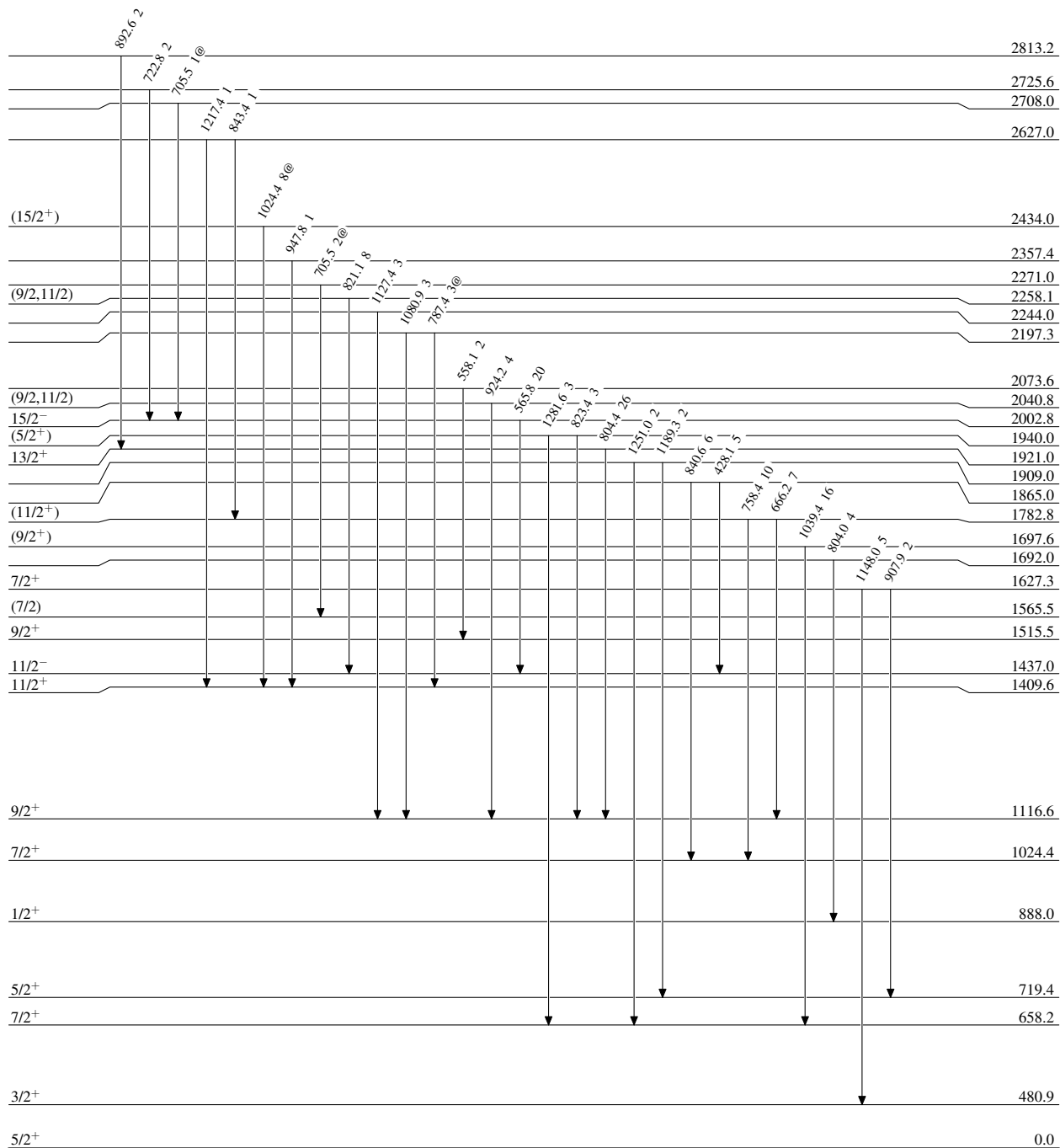
$^{96}\text{Zr}(^3\text{He}, 2n\gamma)$  1987Ca04

## Level Scheme

Intensities: Relative  $I_\gamma$   
 @ Multiply placed: intensity suitably divided

## Legend

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

 $^{97}_{42}\text{Mo}_{55}$

$^{96}\text{Zr}(^3\text{He}, 2n\gamma)$  1987Ca04

## Level Scheme (continued)

Intensities: Relative  $I_\gamma$   
 @ Multiply placed: intensity suitably divided

## Legend

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

